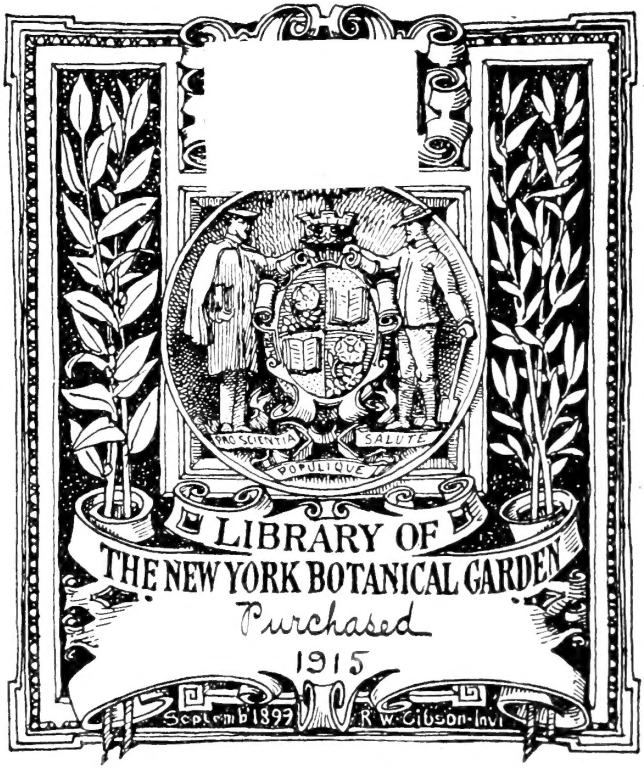

PAC SCIENTIA SALUTE POPULIQUE
LIBRARY OF
THE NEW YORK BOTANICAL GARDEN
Purchased
1915
Septemb 1899
R.W. Gibson Invt

THE

JOURNAL

OF THE

ROYAL AGRICULTURAL SOCIETY

OF ENGLAND.

SECOND SERIES.

VOLUME THE FIFTEENTH.

PRACTICE WITH SCIENCE.

LONDON:
JOHN MURRAY, ALBEMARLE STREET.
1879.

THESE EXPERIMENTS, IT IS TRUE, ARE NOT EASY; STILL THEY ARE IN THE POWER OF EVERY THINKING HUSBANDMAN. HE WHO ACCOMPLISHES BUT ONE, OF HOWEVER LIMITED APPLICATION, AND TAKES CARE TO REPORT IT FAITHFULLY, ADVANCES THE SCIENCE, AND, CONSEQUENTLY, THE PRACTICE OF AGRICULTURE, AND ACQUIRES THEREBY A RIGHT TO THE GRATITUDE OF HIS FELLOWS, AND OF THOSE WHO COME AFTER. TO MAKE MANY SUCH IS BEYOND THE POWER OF MOST INDIVIDUALS, AND CANNOT BE EXPECTED. THE FIRST CARE OF ALL SOCIETIES FORMED FOR THE IMPROVEMENT OF OUR SCIENCE SHOULD BE TO PREPARE THE FORMS OF SUCH EXPERIMENTS, AND TO DISTRIBUTE THE EXECUTION OF THESE AMONG THEIR MEMBERS.

VAN THAER, *Principles of Agriculture.*

LONDON: PRINTED BY WILLIAM CLOWES AND SONS, STAMFORD STREET
AND CHARING CROSS.

CONTENTS OF VOLUME XV.

Second Series.

STATISTICS:— PAGE

Meteorology for the year 1878 .. .. I-X
Imports of Corn, &c., British Wheat sold, and Average Prices XI-XV
Acreage under each description of Crop, Fallow, and Grass; and Number of Cattle, Sheep, and Pigs in Great Britain and Ireland, 1876, 1877, and 1878 .. .. XVI, XVII
Number of Beasts exhibited, and the Prices realised for them at the Christmas Markets, since 1843 XVIII
Importations and Average Prices of certain Foreign and Colonial Productions XIX
Statistics of Dairy Produce, and Prices Current .. .. .. XX-XXIV

ARTICLE

I.—Report on the Farm-Prize Competition of 1878. By Frederic Beard, of Horton, near Canterbury 1
II.—Report on the System of Cheese-making practised on the Four Prize Dairy Farms. By Thomas Jackson, of Tattenhall, near Chester 37
III.—Report of the Senior Steward of Live Stock at Bristol. By J. Shuttleworth, of Hartsholme Hall, Lincoln 43
IV.—Report on the Exhibition of Live Stock at Bristol. By James H. Caird, Esq., of Northbrook, Micheldever, Hants 45
V.—Report on the Exhibition of Implements at Bristol. By J. Hemsley, of Shelton, Newark, Senior Steward 71
VI.—Report on the Trials of Sheaf-Binders and Miscellaneous Implements at Bristol. By John Coleman, of Riccall Hall, York .. 73
VII.—Report on the Trial of Dairy Implements and Machinery at Bristol. By Gilbert Murray, of Elvaston, Derby 132
VIII.—Concluding Report on the Experiments at the Brown Institution on Pleuro-Pneumonia. By J. Burdon-Sanderson, M.D., LL.D., F.R.S., late Superintendent of the Brown Institution. With an Appendix by W. Duguid, Esq., M.R.C.V.S., late Veterinary Surgeon at the Institution 157
IX.—The Agricultural Features of the Paris Exhibition. By William Macdonald, Editor 'North British Agriculturist,' and James Macdonald, Agricultural Reporter, 'Scotsman' 174
X.—Report on the Dairy-Farming of the North-west of France. By H. M. Jenkins, F.G.S., Secretary of the Society, and Editor of the 'Journal' 278

ARTICLE PAGE

XI.—The late Sir William Miles, Bart., M.P., Vice-President, and Ex-President of the Society. By J. D. Dent and Sir B. T. Brandreth Gibbs, Vice-President of the Society 322

XII.—The late Mr. T. C. Booth, of Warlaby. By H. Chandos-Pole-Gell, of Hopton Hall, Derbyshire 326

XIII.—Report on the Field and Feeding Experiments conducted at Woburn, on behalf of the Royal Agricultural Society of England, during the Year 1878. By Dr. Augustus Voelcker, F.R.S., Consulting Chemist to the Society 332

XIV.—Annual Report of the Consulting Chemist for 1878. By Dr. Augustus Voelcker, F.R.S. 346

XV.—Annual Report of the Consulting Botanist for 1878. By W. Carruthers, F.R.S. 352

Additions to the Library in 1878 354

Catalogue of Books and Pamphlets in the Library, Dec. 31st, 1877 357

XVI.—Sutherland Reclamation. By Charles Gay Roberts, of Haslemere, Surrey 397

XVII.—The Advantage of converting Cold Arable Clay Land into Permanent Pasture, and the best Method of doing it. By W. T. Carrington, of Croxden Abbey, Uttoxeter 487

XVIII.—Waste Hill Lands: How they may be Utilised by Pony Breeding. By J. Nevill Fitt 497

XIX.—Cow-Keeping by Farm Labourers. By Henry Evershed .. 511

XX.—Notes on a Report of Victor Drummond, Esquire, on the Foreign Commerce of the United States for the fiscal year ended June 30, 1878. Washington, January 18, 1879. By J. D. Dent, of Ribston Hall, Weatherby 543

XXI.—Report of the Senior Steward of Live Stock on the International Exhibition at Kilburn, 1879. By W. Wells, Senior Steward 555

XXII.—Report on the Exhibition of Horses at Kilburn. By the Hon. Francis Lawley 565

XXIII.—Report on the British and Foreign Cattle exhibited at Kilburn. By Thomas Bowstead, Edenhall, Cumberland 601

XXIV.—Report on the Exhibition of British and Foreign Sheep, Goats, and Pigs, at Kilburn. By William Housman 640

XXV.—Report on Butter, Cheese, Provisions, &c., at Kilburn. By Professor Baldwin, of Glasnevin, Dublin 668

XXVI.—Report on the Bees, Hives, Honey, and Manipulations with Bees, at the Kilburn Show, 1879 679

XXVII.—Report upon the Exhibition of Hops at Kilburn. By Charles Whitehead, F.L.S., F.G.S., &c., of Barming House, Maidstone, Steward 682

XXVIII.—Report on the Exhibition of Implements at Kilburn. By G. H. Sanday, of Wensley House, Bedale, Senior Steward .. 685

XXIX.—Report on the Exhibition of Implements; Award of Medals, &c., at the International Meeting at Kilburn. By John Coleman, of Riccall Hall, York 688

ARTICLE. PAGE

XXX.—Report on the Trial of Railway Waggons intended for the Conveyance of Fresh Provisions. By John Coleman, of Riccall Hall, York 759

XXXI.—Report of the Judges of Farm Plans sent in for Competition at the London International Exhibition, 1879. By J. Bailey Denton 774

XXXII.—Report upon the Market-Garden and Market Garden Farm Competition, 1879. By Charles Whitehead, Barming House, Maidstone 832

APPENDIX.

PAGE

List of Officers of the Royal Agricultural Society of England, 1879 i, xlix
Standing Committees for 1879 .. .. iii, li
Report of the Council to the General Meeting, December 12, 1878, and May 22, 1879 .. .. v, liii
Distribution of Members and Council x
Half-yearly Cash Account from 1st July to 31st December, 1878, and from 1st January to 24th June, 1879 .. .. xii, lviii
Yearly Cash Account from 1st January to 31st December, 1878 .. xiv
Country Meeting Account: Bristol, 1878 xvi
London Meeting, 1879: Schedule of Prizes, &c. xviii
Memoranda of Meetings, Payment of Subscriptions, &c. .. .. .. xliii, clii
Members' Veterinary Privileges .. .. xliv, cliii
Guide to the Purchase of Artificial Manures and Feeding Stuffs .. xlvi, clv
Members' Botanical and Entomological Privileges .. .. .. xlviii, clvii
List of Stewards and Judges, and award of Prizes at Kilburn .. lx
Agricultural Education: Examination Papers, 1879 cxlii
Members' Chemical Privileges .. .. xlv, cliv
List of Members.

DIRECTIONS TO THE BINDER.

List of Members *at the end.*

The Binder is desired to collect together all the Appendix matter, with Roman numeral folios, and place it at the *end* of each volume of the Journal, excepting Titles and Contents, and Statistics, &c., which are in all cases to be placed at the *beginning* of the Volume; the lettering at the back to include a statement of the *year* as well as the *volume;* the first volume belonging to 1839–40, the second to 1841, the third to 1842, the fourth to 1843, and so on.

In Reprints of the Journal all Appendix matter and, in one instance, an Article in the body of the Journal (which at the time had become obsolete), were omitted; the Roman numeral folios, however (for convenience of reference), were reprinted without alteration in the Appendix matter retained.

METEOROLOGY; IMPORTATIONS OF GRAIN; SALES OF BRITISH WHEAT; PRICES OF CORN AND OTHER PRODUCE; AGRICULTURAL STATISTICS; AND STATISTICS OF DAIRY PRODUCE.

[*The facts are derived chiefly from the Meteorological Reports of* Mr. Glaisher, *and the Returns of the* Board of Trade *and of the* Inspector-General of Imports and Exports.]

METEOROLOGY.—1878.

First Quarter (*January, February, March*).—The month of January was unusually mild, the sky was generally overcast, and there was very little sunshine; the fall of rain was less than the average, and the fall of snow till after the 24th was small in amount. Till the 24th day, with few exceptions, the temperature was above its average; the temperatures on the 21st and 22nd, both day and night, were extremely high, and the average excess of daily temperature from January 1st to the 24th was 5°·1. On the 25th a cold period set in, and continued to February 12th. Snow fell daily, chiefly in the north. On February 13th a very warm period set in, and on the 17th there was a remarkably high day-temperature; this very warm period continued till March 13th. For the 28 days ending March 13th, the daily excess of temperature was on the average as large as 7°; then there occurred 5 days of low temperature, snow falling over the Midland and Northern Counties daily; the average daily deficiency of temperature was $4\frac{1}{4}°$; then 4 days (March 18th–22nd) of warmth followed, the excess of temperature being $6\frac{1}{4}°$. Up to this time the weather for the whole quarter had been exceedingly mild; but on the 23rd day of March bad weather set in with severity, and from this day to the end of the quarter the weather was bitterly inclement; snow fell every day, accompanied with very cold N. and N.E. winds, and no more trying weather during the winter was experienced than on March 29th and 30th. The snow on these days was large in amount, and was general over the whole country. The average deficiency of temperature for the 10 days ending March 31st was as large as $6\frac{3}{4}°$ daily.

The *mean temperature* of the quarter was 41°·5, and exceeded by 2°·8 the average for the corresponding period in 107 years. The

mean monthly excess was equal to 3°·9 in January, 3°·5 in February, and 0°·9 in March.

The *fall of rain* was below its average in each month; the amount in the quarter was 3 inches, and back to 1815 there have been only four instances of so small an amount in these three months, viz.:—In the year 1820, when it was 3 inches; in 1829, when it was 2·4 inches; in 1850, when it was 2·8 inches: and in 1874, when it was 2·4 inches.

The readings of the barometer were high upon the whole quarter. In January the mean reading was 29·979 inches. In February the mean reading was 30·101 inches; and there are only two Februaries back to 1841 in which this reading was exceeded, viz.:—In 1849, when it was 30·106 inches; and in 1863, when it was 30·141 inches.

Second Quarter (April, May, June).—The weather was cold and ungenial until 11th April, when a warm period set in and lasted until 19th May. From 20th May till 19th June the weather was again cold; after the latter day, high temperatures prevailed until the end of the quarter, especially on 24th, 25th, 26th, and 27th June.

The *mean temperature* of the quarter was 54°·6, and exceeded the average for the corresponding period in 107 years by 2°·3. The mean temperature of each month was considerably above its respective average; the excess was equal to 2°·1 in April, 2°·7 in May, and 2°·1 in June.

The *rainfall* of the quarter at Greenwich was no less than 13·2 inches, and exceeded the average amount in the corresponding period of 63 years by 7·6 inches; 4·3 inches were measured both in April and May, and 4·6 inches in June. The excess of rainfall was equal to 2·6 inches in April, 2·3 in May, and 2·7 in June. So far back as 1815, there is no record of so heavy a rainfall during the three months ending June, as that measured last quarter; the nearest approach to it was 10·7 inches in 1860, which was, however, 2·5 inches less than the amount measured last quarter. At the various stations of observation, the smallest recorded rainfall of the quarter was 5·5 inches at Llandudno; while at the other stations the amounts ranged upwards to 14·6 inches at Bath, and 15·6 at Camden Square, London. Rain was measured on but 41 days at Hull and Ventnor, and on 63 and 64 days respectively at Torquay and Truro.

On the 10th and 11th of April the rainfall in the London district was very remarkable. At Caterham the fall in the two days was 1·6 inch; at Croydon, 2·2 inches; at Blackheath, 2 inches nearly; at Greenwich Observatory, 2·8 inches; north of London, at Camden

Square, where the fall was the heaviest, 3·23 inches; at Muswell Hill, 2·8 inches; at Chiswick, 2·3 inches; and Mr. G. J. Symonds states that 2½ inches out of the 3·23 inches fell in 12 hours. This unusual fall of rain caused very heavy floods at low-lying places south of the Thames. In May, rain fell on nearly every day from the 6th; there were many heavy rainfalls between May 6th and May 11th; the heaviest was at Bath, viz., 2 inches on the 10th, causing serious floods in the city. On the same day rain exceeding an inch fell at Wilton and Wrottesley; on the 11th the fall was 1·8 inch at Gloucester, and nearly 0·9 inch at Marlborough, and moderately heavy falls on this day occurred in Cornwall and Devonshire. On the 7th there was nearly an inch at Ramsgate; an inch or more at Royston, Cardington, Cambridge, Somerleyton, and more than half an inch at many places. On the 8th more than an inch fell at Leicester; and on the 9th the fall exceeded half an inch at many places. At Greenwich, on the 7th, the fall was 1·6 inch, of which one inch fell between 6 h. P.M. and 6 h. 50 m. P.M. On June 23rd a second almost unprecedented local fall of rain occurred in the London district; but it was chiefly confined to the north of London. At Camden Square, Mr. Symonds measured 3·28 inches of rain, as falling between 1 h. 32 m. P.M. and 3 h. 2 m. P.M., and he remarks that no rain fell between 2 h. 12 m. and 2 h. 46 m., so that this large amount of rain actually fell in 56 minutes. The area over which this heavy rain fell was small; there was no rain at Kew; at Blackheath the fall was 0·58 inch; and at most places within a few miles of London, the fall was a few tenths of an inch only. This heavy fall of rain caused the streets in the north of London to be as running rivers, and very much damage was done; a main drain near Camden Square burst.

The readings of the barometer were generally below the average throughout the quarter, and showed the greatest depression in May.

The number of hours of bright sunshine measured during the quarter at the Greenwich Observatory was 500, against 486 in the corresponding quarter of last year. June was especially sunless.

	The earliest.		The latest.	
Field elm in leaf,	April 21st,	at Oxford and Guernsey;	May 1st,	at Osborne.
Wych elm "	" 21st "	Oxford;	" 7th "	Torquay.
Oak "	" 21st "	Strathfield;	" 7th "	Torquay.
Lime "	" 9th "	Strathfield;	April 27th "	Guernsey.
Sycamore "	" 1st "	Strathfield;	" 23rd "	Torquay.
Horsechestnut	" 7th "	Osborne;	" 20th "	Torquay.
Common poplar	" 10th "	Strathfield;	May 13th "	Llandudno.
Hawthorn "	" 1st "	Osborne;	" 5th "	Silloth.

	The earliest.		The latest.	
Hazel in leaf,	April 20th	at Oxford;	May 7th	at Torquay.
Apple in blossom,	„ 19th	„ Llandudno;	April 28th	„ Weybridge.
Pear „	„ 5th	„ Silloth;	„ 27th	„ Torquay.
Lilac „	„ 21st	„ Oxford;	May 6th	„ Llandudno.
Laburnum „	„ 29th	„ Silloth;	„ 5th	„ Oxford.
Honeysuckle „	June 2nd	„ Weybridge;	June 10th	„ Torquay.
Wheat in flower,	„ 15th	„ Llandudno;	„ 26th	„ Kelstern.
Wheat in ear,	„ 8th	„ Cardington;	„ 13th	„ Strathfield & Weybridge.
Barley „	„ 20th	„ Cardington & Llandudno;	„ 25th	„ Kelstern.
Cuckoo arrived,	April 14th	„ Stonyhurst;	May 3rd	„ Royston.
Swallow „	„ 7th	„ Osborne;	„ 10th	„ Torquay.
Nightingale	„ 14th	„ Weybridge;	April 18th	„ Streatley.

Third Quarter (July, August, September).—The weather at the beginning of July was cold. It somewhat moderated from the 5th to the 8th; but cool and cloudy weather was experienced till the 15th, and the average daily deficiency of temperature for the first 15 days of the quarter was 1°. On the 16th the weather underwent a favourable change to higher temperature, bright sunshine, and no rain. The hottest day in the month was the 19th, on which day the temperature in the shade exceeded 80°; this warm period continued till the 24th; the average excess of mean temperature was 7¼° daily. On the 25th the weather was cool and was changeable to August 3rd, but chiefly cold. From August 4th to the 11th the daily excess of mean temperature was 3°·6; from the 12th to the 21st the temperature was nearly that of its average, the sky was mostly cloudy, and rain fell on nearly every day; on the 22nd a warm period began, but the weather continued unsettled till the end of August, with nearly constant rain and frequent thunderstorms over the country. At the beginning of September the weather was clear and bright, without rain; the mean excess of daily temperature for the 21 days ending September 11th was 1°·9 daily; from the 12th to the end of the month, the changes in temperature were frequent, and the weather was mostly cold; the average deficiency of temperature for the last 15 days of the quarter was 2°·1 daily.

The *mean temperature* of the quarter was 60°·8, and exceeded the average for the corresponding period in 107 years by 0°·9; an excess of mean temperature prevailed in each month of the quarter, which was equal to 1°·5 in July, 0°·9 in August, and 0°·2 in September. At 44 stations of observation the mean temperature of the quarter ranged from 57° at North Shields to 62°·5 at Barnstaple. The mean temperature at Greenwich exceeded the average in each of the first nine months of this year, the mean excess in the nine months being 2°.

The *rainfall* of the quarter at Greenwich was 6·5 inches, of which no less than 5·4 inches fell in August, and only 0·3 and 0·8 of an inch respectively in July and September. The amount in the quarter was nearly an inch below the average; the fall in August showed an excess of 3 inches, whereas the deficiency in July and September was equal to 2·3 and 1·6 inches. The rainfall in August was unprecedently large; so far back as 1815, the nearest approach to it was 4·6 inches in 1837. During the past 63 years, only three times in July and five times in September was the measured rainfall so low as that recorded in those months of last quarter. At 44 stations of observation the rainfall of the quarter ranged from 5·3 inches at Cambridge, to 14·4 inches at Stonyhurst. Rain was measured on only 33 days at Osborne and Strathfield Turgiss, but on 46 days at Nottingham and Stonyhurst, and on 57 at Allenheads. The rainfall at Greenwich during the first nine months of this year amounted to 22·8 inches, and exceeded the average amount in 63 years by 4·7 inches.

The number of hours of bright sunshine measured during the quarter at Greenwich Observatory was 451 against 441 in the corresponding quarter of last year.

The readings of the barometer ruled considerably below the average during August, whereas they showed a slight mean excess both in July and September.

Wheat was cut on the 17th of July at Helston; on the 24th at Osborne; on the 25th at Guernsey and Strathfield; and on the 29th at Cardington. On the 1st of August at Oxford and Stockton; on the 5th at Torquay; on the 13th at Kelstern; and on the 15th at Bath.

Barley was cut on the 25th of July at Guernsey, and on the 31st at Cardington. On the 13th of August at Torquay. On the 3rd of September at Strathfield.

Oats were cut on the 8th of July at Helston; on the 22nd at Guernsey; and on the 30th at Osborne. On the 2nd of August at Oxford; and on the 13th at Torquay.

Fourth Quarter (*October*, *November*, *December*).—The weather was generally fine and warm till the 21st of October, the average daily excess of temperature up to this day being 3°·4. From the 22nd day the weather became cold and the sky cloudy, with rain falling frequently; this unpleasant weather continued throughout November and during the first few days of December. On the 6th of December the cold increased in intensity, severe frosts set in, and very low temperatures without intermission continued till the evening of the 25th of December; the average deficiency of daily temperature below their averages for the 65 days ending December 25th was 5°·6; between December 6th and December 25th, on several

days the mean temperature was more than 12° below its average, and on the 24th it was as large as 17½° below; the average daily deficiency of mean temperature for the 20 days ending December 25th was 10°·8. On December 26th the weather suddenly changed, and became much warmer; the mean temperature of both December 30th and 31st was about 14° in excess of the average, being 31° to 32° higher than that of six days before; viz., on December 24th.

The cold winterly weather in December was general over the country, and on some of the days the temperature was extremely low.

The *mean temperature* for October was 51°·5, being 1°·9 and 1°·3 above the averages of the preceding 107 years and 37 years respectively. It was 2°·9 *higher* than the value in 1877, and 1°·3 *below* that in 1876.

The *mean temperature* for November was 39°·7, being 2°·6 and 3°·9 below the averages of the preceding 107 years and 37 years respectively. It was lower than any value back to 1871, when it was 37°·6, and, with this exception, it is 16 years (or back to 1862) since we have had so cold a November as in the present year (1878). The value in 1862 was 39°·8.

The *mean temperature* for December was 33°·7, being 5°·4 and 6°·5 below the averages of the preceding 107 years and 37 years respectively. The following are the only instances back to 1771 when the mean temperature of December was as low as that in 1878, viz., 33°·7:

In 1784	when it was	31°·0	In 1840	when it was	33°·3
„ 1788	„	29°·0	„ 1844	„	33°·0
„ 1796	„	30°·4	„ 1846	„	32°·9
„ 1798	„	33°·7	„ 1870	„	33°·6
„ 1799	„	32°·8	„ 1874	„	33°·2

The *mean temperature* for the quarter was 41°·6, being 2° and 3° below the averages of the preceding 107 years and 37 years respectively.

The *fall of rain* at Greenwich in October was 1·7 inch, being 1·1 inch below the average of 63 years. The fall in November was 3·5 inches, being 1·1 inch above the average; and the fall in December was 1·2 inch, being 0·9 inch below the average. The total fall for the quarter was 6·4 inches, or 0·9 inch below the average.

The mean reading of the barometer, in the neighbourhood of London, was below the average in each month of the quarter. The highest reading of the barometer was 30·30 inches on November 19th, and the lowest reading was 28·86 inches on October 26th, the extreme range of readings being 1·44 inch.

TABLE I.—METEOROLOGICAL OBSERVATIONS RECORDED AT THE ROYAL OBSERVATORY, GREENWICH, IN THE FIRST SIX MONTHS OF THE YEAR 1878.

1878. MONTHS.	Temperature of Air. Mean.	Air. Diff. from average of 107 years.	Air. Diff. from average of 37 years.	Evaporation. Mean.	Evaporation. Diff. from average of 37 years.	Dew Point. Mean.	Dew Point. Diff. from average of 37 years.	Air—Daily Range. Mean.	Air—Daily Range. Diff. from average of 37 years.	Water of the Thames.	Elastic Force of Vapour. Mean.	Elastic Force of Vapour. Diff. from average of 37 years.	Weight of Vapour in a Cubic Foot of Air. Mean.	Weight of Vapour in a Cubic Foot of Air. Diff. from average of 37 years.
	°	°	°	°	°	°	°	°	°	°	in.	in.	grs.	grs.
January ..	40·4	+3·9	+1·7	38·4	+1·2	36·0	+0·8	9·1	−0·6	41·3	0·212	+0·010	2·4	0·0
February ..	42·2	+3·5	+2·9	40·5	+2·9	38·5	+3·5	9·7	−1·6	41·7	0·233	+0·027	2·7	+0·3
March ..	42·0	+0·9	+0·4	38·5	−0·8	34·3	−2·0	13·5	−1·1	46·5	0·198	−0·018	2·3	−0·2
Means ..	41·5	+2·8	+1·7	39·1	+1·1	36·3	+0·8	10·8	−1·1	43·2	0·214	+0·006	2·5	0·0
	°	°	°	°	°	°	°	°	°	°	in.	in.	grs.	grs.
April	48·2	+2·1	+1·1	45·2	+1·2	42·0	+1·4	17·6	−1·0	48·3	0·266	+0·012	3·0	+0·1
May	55·2	+2·7	+2·6	51·6	+2·7	48·1	+3·0	17·8	−2·7	59·0	0·332	+0·033	3·8	+0·3
June	60·3	+2·1	+1·3	55·8	+1·3	51·8	+1·2	20·6	−0·6	60·9	0·387	+0·017	4·3	+0·2
Means ..	54·6	+2·3	+1·7	50·9	+1·7	47·3	+1·9	18·7	−1·4	56·1	0·328	+0·021	3·7	+0·2

NOTE.—In reading this Table it will be borne in mind that the *minus* sign (−) signifies *below* the average, and that the *plus* sign (+) signifies *above* the average.

TABLE II.—METEOROLOGICAL OBSERVATIONS RECORDED AT THE ROYAL OBSERVATORY, GREENWICH, IN THE LAST SIX MONTHS OF THE YEAR 1878.

1878. MONTHS.	Temperature of Air. Mean.	Air. Diff. from average of 107 years.	Air. Diff. from average of 37 years.	Evaporation. Mean.	Evaporation. Diff. from average of 37 years.	Dew Point. Mean.	Dew Point. Diff. from average of 37 years.	Air—Daily Range. Mean.	Air—Daily Range. Diff. from average of 37 years.	Water of the Thames.	Elastic Force of Vapour. Mean.	Elastic Force of Vapour. Diff. from average of 37 years.	Weight of Vapour in a Cubic Foot of Air. Mean.	Weight of Vapour in a Cubic Foot of Air. Diff. from average of 37 years.
	°	°	°	°	°	°	°	°	°	°	in.	in.	grs.	grs.
July	63·1	+1·5	+0·9	58·6	+0·9	54·7	+0·8	19·6	−1·6	67·7	0·430	+0·013	4·8	+0·2
August ..	62·7	+0·9	+1·2	59·1	+1·7	56·1	+2·3	17·5	−2·4	66·2	0·450	+0·033	5·0	+0·4
September	56·7	+0·2	−0·4	53·7	−0·2	50·9	−0·1	18·3	−0·2	58·4	0·373	−0·005	4·2	0·0
Means ..	60·8	+0·9	+0·6	57·1	+0·8	53·9	+1·0	18·5	−1·4	64·1	0·418	+0·014	4·7	+0·2
	°	°	°	°	°	°	°	°	°	°	in.	in.	grs.	gr.
October ..	51·5	+ 1·9	+ 1·3	49·0	+0·9	46·4	+0·4	14·0	− 0·8	55·2	0·317	+0·005	3·5	− 0·1
November ..	39·7	− 2·6	− 3·9	38·2	−3·2	36·2	−3·3	9·3	− 2·3	42·6	0·214	−0·033	2·5	− 0·3
December ..	33·7	− 5·4	− 6·5	32·8	−5·9	31·2	−5·7	8·4	− 1·0	35·9	0·175	−0·046	2·1	− 0·5
Means ..	41·6	− 2·0	− 3·0	40·0	−2·7	37·9	−2·9	10·6	− 1·4	44·6	0·235	−0·025	2·7	− 0·3

NOTE.—In reading this Table it will be borne in mind that the *plus* sign (+) signifies *above* the average and that the *minus* sign (−) signifies *below* the average.

TABLE III.—METEOROLOGICAL OBSERVATIONS RECORDED AT THE ROYAL OBSERVATORY, GREENWICH, IN THE FIRST SIX MONTHS OF THE YEAR 1878.

1878. MONTHS.	Degree of Humidity.		Reading of Barometer.		Weight of a Cubic Foot of Air.		Rain.		Daily Horizontal movement of the Air.	Reading of Thermometer on Grass.				
										Number of Nights it was			Lowest Reading at Night.	Highest Reading at Night.
	Mean.	Diff. from average of 37 years.	Mean.	Diff. from average of 37 years.	Mean.	Diff. from average of 37 years.	Amount.	Diff. from average of 63 years.		At or below 30°.	Between 30° and 40°.	Above 40°.		
			in.	in.	grs.	grs.	in.	in.	Miles.				°	°
January ..	84	− 3	29·979	+0·231	556	+ 3	0·9	−1·1	330	17	8	6	19·5	45·1
February ..	87	+ 3	30·101	+0·308	556	+ 3	1·1	−0·4	219	6	18	4	19·7	45·0
March ..	75	− 7	29·890	+0·154	552	+ 2	1·1	−0·5	348	16	8	7	13·5	48·0
							Sum	Sum	Mean	Sum	Sum	Sum	Lowest	Highest
Means ..	82	− 2	29·990	+0·231	555	+ 3	3·1	−2·0	299	39	34	17	13·5	48·0
			in.	in.	grs.	grs.	in.	in.	Miles.				°	°
April ..	79	+ 1	29·663	−0·100	541	− 2	4·3	+2·6	281	8	16	6	23·0	48·0
May	78	+ 2	29·618	−0·168	532	− 9	4·3	+2·3	289	0	8	23	31·6	53·3
June ..	74	0	29·770	−0·044	530	− 2	4·6	+2·7	205	0	1	29	38·0	54·5
							Sum	Sum	Mean	Sum	Sum	Sum	Lowest	Highest
Means ..	77	+ 1	29·684	−0·104	534	− 4	13·2	+7·6	258	8	25	58	23·0	54·5

NOTE.—In reading this Table it will be borne in mind that the *plus* sign (+) signifies *above* the average, and that the *minus* sign (−) signifies *below* the average.

TABLE IV.—METEOROLOGICAL OBSERVATIONS RECORDED AT THE ROYAL OBSERVATORY, GREENWICH, IN THE LAST SIX MONTHS OF THE YEAR 1878.

1878. MONTHS.	Degree of Humidity.		Reading of Barometer.		Weight of a Cubic Foot of Air.		Rain.		Daily Horizontal movement of the Air.	Reading of Thermometer on Grass.				
										Number of Nights it was			Lowest Reading at Night.	Highest Reading at Night.
	Mean.	Diff. from average of 37 years.	Mean.	Diff. from average of 37 years.	Mean.	Diff. from average of 37 years.	Amount.	Diff. from average of 63 years.		At or below 30°.	Between 30° and 40°.	Above 40°.		
			in.	in.	grs.	grs.	in.	in.	Miles.				°	°
July	75	0	29·863	+0·060	528	0	0·3	−2·3	218	0	2	29	39·0	60·2
August ..	79	+ 3	29·586	−0·206	523	− 6	5·4	+3·0	261	0	0	31	45·0	57·9
September	81	+ 1	29·819	+0·015	534	+ 1	0·8	−1·6	248	0	10	20	31·6	53·1
							Sum	Sum	Mean	Sum	Sum	Sum	Lowest	Highest
Means ..	78	+ 1	29·756	−0·044	528	− 2	6·5	−0·9	242	0	12	80	31·6	60·2
	°	°	in.	in.	grs.	grs.	in.	in.	Miles.				°	°
October ..	83	− 4	29·602	−0·100	536	− 3	1·7	−1·1	259	2	16	13	27·9	52·1
November	88	0	29·571	−0·172	549	+ 1	3·5	+1·1	308	11	19	0	25·1	39·5
December	89	+ 1	29·546	−0·247	555	+ 3	1·2	−0·9	248	21	8	2	12·2	45·0
							Sum	Sum	Mean	Sum	Sum	Sum	Lowest	Highest
Means ..	87	− 1	29·573	−0·173	547	0	6·4	−0·9	272	34	43	15	12·2	52·1

NOTE.—In reading this Table it will be borne in mind that the *plus* sign (+) signifies *above* the average, and that the *minus* sign (−) signifies *below* the average.

CORN: Importations, Sales, and Prices.

Table V.—Quantities of Wheat, Wheatmeal and Flour, Barley, Oats, Peas and Beans, Imported into the United Kingdom in the Year 1878.

1878.	Wheat.	Wheatmeal and Flour.	Barley.	Oats.	Peas.	Beans.
	cwts.	cwts.	cwts.	cwts.	cwts.	cwts.
January ..	3,974,577	829,108	1,503,826	993,164	79,795	173,972
February	3,727,747	829,642	799,897	596,462	54,197	334,974
March ..	4,541,369	911,303	1,066,432	639,411	118,687	179,297
April ..	4,168,020	717,455	982,440	1,067,114	132,758	207,652
May ..	4,197,262	631,453	1,009,098	1,127,168	153,988	146,153
June ..	4,745,934	541,845	1,059,944	1,294,065	155,931	42,064
In first Six Months	25,354,909	4,460,806	6,421,637	5,717,384	695,356	1,084,112
July	4,106,561	449,374	1,558,291	1,507,782	250,599	77,100
August ..	3,230,031	355,661	888,606	1,082,452	225,850	279,227
September	4,592,620	494,261	1,147,930	690,344	125,698	58,832
October ..	4,897,981	629,309	1,892,265	1,344,743	147,648	185,705
November	4,128,182	692,636	1,063,924	1,180,437	187,377	116,683
December	3,501,359	741,952	1,189,375	1,242,647	172,205	68,849
In last Six Months	24,456,734	3,363,193	7,740,391	7,048,405	1,109,377	786,396
Year ..	49,811,643	7,823,999	14,162,028	12,765,789	1,804,733	1,870,508

Note.—The average weights *per quarter* of corn, as adopted in the office of the Inspector-General of Imports and Exports, are as follow:—For wheat, 485⅓ lbs., or 4⅓ cwts.; for barley, 400 lbs., or 3⅗ cwts.; for oats, 308 lbs., or 2¾ cwts. Corn has been entered by *weight* instead of *measure* since September, 1864. No duty has been charged since 1st June, 1869.

Table VI.—Computed Real Value of Corn Imported into the United Kingdom in each of the Five Years, 1874-78.

	1874.	1875.	1876.	1877.	1878.
	£.	£.	£.	£.	£.
Wheat	25,201,062	27,418,970	23,140,766	33,820,084	27,397,487
Barley	5,266,096	4,630,654	3,745,420	5,396,791	5,545,802
Oats	5,118,785	5,407,928	4,619,427	4,998,864	4,553,946
Maize	7,484,178	8,112,158	12,744,432	9,851,236	12,589,422
Other kinds	1,959,237	2,304,218	2,555,397	2,321,922	1,463,433
Wheat Flour	5,709,820	4,828,167	4,729,206	6,803,327	6,790,320
Other kinds of Flour	14,405	12,130	15,474	17,284	32,214
Total of Corn ..	50,753,583	52,714,225	51,550,122	63,209,508	58,372,624

TABLE VII.—QUANTITIES of BRITISH WHEAT SOLD in the Towns from which Returns are received under the Act of the 27th & 28th VICTORIA, cap. 87, and their AVERAGE PRICES, in each of the TWELVE MONTHS of the YEARS 1873-78.

	QUANTITIES IN QUARTERS.					
	1873.	1874.	1875.	1876.	1877.	1878.
	quarters.	quarters.	quarters.	quarters.	quarters.	quarters.
First month ..	183,987	187,106	210,661	154,367	152,557	146,848
Second month	202,977	189,031	223,974	188,539	173,729	164,387
Third month (five weeks)	238,125	206,145	292,172	208,367	213,718	174,025
Fourth month	159,268	150,725	233,970	160,868	150,012	146,933
Fifth month ..	225,595	175,715	234,683	174,153	132,231	166,909
Sixth month (five weeks)	219,750	172,298	216,016	188,611	122,390	137,981
Seventh month	101,101	95,871	121,684	90,626	77,674	82,597
Eighth month	96,986	82,564	135,456	88,030	89,759	119,611
Ninth month (five weeks)	266,856	323,153	199,314	314,327	225,659	272,699
Tenth month	265,122	248,984	226,503	216,393	217,046	329,564
Eleventh month	214,026	225,162	186,607	192,440	175,262	216,187
Twelfth month (five weeks)	285,648	335,339	234,035	225,254	212,627	276,943

	AVERAGE PRICES PER QUARTER.					
	1873.	1874.	1875.	1876.	1877.	1878.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
First month ..	55 10	62 4	44 4	44 11	51 7	51 11
Second month	56 5	63 4	42 3	43 4	51 8	51 5
Third month (five weeks)	55 6	61 1	41 2	43 1	51 1	49 8
Fourth month	54 10	60 0	43 0	44 11	53 4	51 3
Fifth month ..	55 8	62 2	42 5	45 0	65 10	51 11
Sixth month (five weeks)	58 4	61 2	42 2	47 0	64 6	48 0
Seventh month	59 6	60 8	45 3	48 6	62 9	44 11
Eighth month	60 1	58 4	52 4	46 4	64 11	44 7
Ninth month (five weeks)	63 10	48 11	49 3	46 8	59 1	44 1
Tenth month ..	60 10	44 8	46 1	46 7	53 7	39 7
Eleventh month	60 9	43 11	47 4	48 0	52 3	40 1
Twelfth month (five weeks)	61 6	44 6	46 4	49 9	51 6	40 8

TABLE VIII.—AVERAGE PRICES of BRITISH CORN per Quarter (Imperial measure) as received from the INSPECTORS and OFFICERS of EXCISE according to the Act of 27th & 28th VICTORIA, cap. 87, in each of the FIFTY-TWO WEEKS of the YEAR 1878.

Week ending	Wheat.		Barley.		Oats.		Week ending	Wheat.		Barley.		Oats.	
	s.	d.	s.	d.	s.	d.		s.	d.	s.	d.	s.	d.
January 5..	51	8	43	1	24	5	July 6..	46	0	37	2	27	11
January 12..	52	1	43	5	23	8	July 13..	44	8	39	10	26	4
January 19..	52	1	44	8	23	9	July 20..	44	5	35	5	27	6
January 26..	51	10	44	8	24	0	July 27..	44	7	37	4	28	5
February 2..	51	11	44	6	23	11	August 3..	44	10	33	3	27	0
February 9..	51	5	44	3	24	10	August 10..	44	1	35	3	24	1
February 16..	50	11	44	2	24	4	August 17..	44	2	33	3	26	1
February 23..	51	3	44	0	24	1	August 24..	45	2	36	3	27	9
March 2..	50	10	43	6	23	10	August 31..	45	8	42	1	26	2
March 9..	50	2	43	2	24	2	September 7	45	4	42	5	25	4
March 16..	49	6	42	2	23	9	September 14	45	0	41	11	24	4
March 23..	48	11	42	0	24	7	September 21	43	2	40	11	23	6
March 30..	48	9	41	5	23	11	September 28	41	5	41	1	22	10
Average of Winter Quarter	50	10	43	5	24	1	Average of Summer Quarter	44	6	38	2	25	11
April 6..	50	0	42	0	25	3	October 5..	40	4	40	6	22	3
April 13..	51	5	41	9	24	10	October 12..	39	9	40	1	21	10
April 20..	51	11	41	7	25	6	October 19..	39	3	40	4	22	2
April 27..	51	8	42	6	25	10	October 26..	39	0	40	5	21	10
May 4..	52	1	40	6	25	8	November 2	39	0	39	9	22	11
May 11..	52	4	40	2	25	8	November 9	39	8	39	7	22	5
May 18..	52	1	39	5	26	3	November 16	40	7	39	4	21	3
May 25..	51	2	39	6	26	5	November 23	41	2	39	9	21	7
June 1..	50	4	39	10	26	2	November 30	41	3	40	1	21	3
June 8..	49	0	39	10	24	9	December 7	40	11	39	4	21	1
June 15..	47	10	39	2	27	2	December 14	40	10	38	10	21	6
June 22..	46	9	30	9	26	2	December 21	40	8	39	4	21	1
June 29..	46	1	35	2	26	10	December 28	39	9	38	3	20	7
Average of Spring Quarter	50	2	39	4	25	10	Average of Autumn Quarter	40	2	39	7	21	8

TABLE IX.—QUANTITIES of WHEAT, BARLEY, OATS, PEAS, BEANS, INDIAN CORN or MAIZE, WHEATMEAL and FLOUR, IMPORTED in the FOUR YEARS 1875–78; also the COUNTRIES from which the WHEAT, WHEATMEAL, and FLOUR were obtained.

	1875.	1876.	1877.	1878.
Wheat from—	cwts.	cwts.	cwts.	cwts.
Russia	9,995,295	8,769,260	10,838,000	9,032,930
Denmark	493,599	262,518	73,812	*
Germany	5,615,984	2,324,148	5,455,763	5,118,135
France	1,296,920	293,350	1,494,783	11,200
Turkey and Wallachia and Moldavia	1,308,137	1,238,851	1,253,018	240,105
Egypt	2,093,853	2,218,227	2,447,709	217,498
United States	23,463,910	19,299,785	21,308,667	28,963,901
Chili	900,880	982,619	736,011	50,573
British India	1,334,943	3,279,887	6,104,940	1,819,304
British North America	3,604,610	2,417,151	2,912,178	2,603,586
Other countries	1,678,262	3,308,356	1,538,007	1,754,411
Total Wheat	51,786,393	44,394,152	54,162,888	49,811,643
Barley	11,049,476	9,770,075	12,970,751	14,162,028
Oats	12,435,888	11,204,588	12,925,604	12,765,789
Peas	1,603,033	1,609,997	1,511,846	1,804,733
Beans	3,453,371	4,601,206	4,573,482	1,870,508
Indian Corn, or Maize	20,438,480	39,958,226	30,455,681	41,631,348
Wheatmeal and Flour from—				
Germany	796,301	930,469	1,239,437	1,118,761
France	1,752,079	1,083,447	1,900,213	696,059
United States	2,273,846	2,320,886	1,771,558	3,635,200
British North America	358,766	282,053	254,695	294,448
Other countries	867,697	1,325,685	2,203,626	2,079,531
Total Wheatmeal and Flour	6,048,689	5,942,540	7,369,529	7,823,999
Indian Corn Meal	7,494	7,706	9,713	41,679

* Included under "Other Countries."

BLE X.—AVERAGE PRICES of Consols, of Wheat, of Meat, and of Potatoes; also the AVERAGE NUMBER of PAUPERS relieved on the *last day* of each Week; and the MEAN TEMPERATURE, in each of the Sixteen Quarters ending December 31st, 1878.

Quarters ending	AVERAGE PRICES.					PAUPERISM.		Mean Temperature.
	Consols (for Money).	Minimum Rate per Cent. of Discount charged by the Bank of England.	Wheat per Quarter in England and Wales.	Meat per lb. at the Metropolitan Meat Market (by the Carcass).		Potatoes (York Regents) per Ton, at Waterside Market, Southwark.	Quarterly Average of the Number of Paupers relieved on the *last day* of each week.		
				Beef.	Mutton.		In-door.	Out-door.	
1875	£.		*s.* *d.*						°
Mar. 31	92⅝	3·70	42 6	5*d.*—8*d.* Mean 6½*d.*	4¾*d.*—8*d.* Mean 6½*d.*	81*s.* 3*d.*—111*s.* 3*d.* Mean 96*s.* 3*d.*	146,708	622,652	39·5
June 30	93⅝	3·50	42 6	5¼*d.*—8¼*d.* Mean 6¾*d.*	5½*d.*—9½*d.* Mean 7½*d.*	80*s.* 6*d.*—120*s.* 6*d.* Mean 100*s.*6*d.*	131,717	592,362	53·4
Sept. 30	94⅜	2·43	49 0	5½*d.*—8½*d.* Mean 7*d.*	5½*d.*—9½*d.* Mean 7½*d.*	70*s.* 6*d.*—93*s.* 6*d.* Mean 82*s.*	125,614	555,409	60·7
Dec. 31	94⅜	3·20	46 7	5⅛*d.*—8¼*d.* Mean 6⅞*d.*	6*d.*—9¼*d.* Mean 7⅝*d.*	105*s.* 6*d.*—127*s.* 6*d.* Mean 116*s.*6*d.*	136,124	546,251	43·1
1876 Mar. 31	94⅛	4·18	43 8	5⅜*d.*—8*d.* Mean 6⅝*d.*	5⅛*d.*—9*d.* Mean 7⅛*d.*	121*s.* 6*d.*—151*s.* Mean 136*s.*6*d.*	145,088	558,026	39·8
June 30	95¼	2·24	45 1	5*d.*—8⅜*d.* Mean 6⅝*d.*	5*d.*—10*d.* Mean 7½*d.*	125*s.*—170*s.* Mean 147*s.*6*d.*	134,357	535,419	51·7
Sept. 30	95⅞	2·00	47 1	5⅝*d.*—8¾*d.* Mean 6⅞*d.*	5⅝*d.*—9⅝*d.* Mean 7⅝*d.*	..	130,349	517,196	61·8
Dec. 31	95⅝	2·00	48 2	4⅛*d.*—8*d.* Mean 6⅛*d.*	5⅛*d.*—9*d.* Mean 7⅛*d.*	..	141,907	514,739	47·0
1877 Mar. 31	95⅞	2·00	51 4	4⅝*d.*—7⅝*d.* Mean 6⅛*d.*	5*d.*—9⅜*d.* Mean 7⅛*d.*	138*s.*—172*s.* Mean 155*s.*	152,778	532,697	42·3
June 30	94⅞	2·96	61 5	4¾*d.*—8⅜*d.* Mean 6⅜*d.*	4⅝*d.*—9⅜*d.* Mean 7*d.*	136*s.*—174*s.* Mean 155*s.*	143,674	523,878	51·9
Sept. 30	95⅛	2·45	62 0	4⅝*d.*—8¾*d.* Mean 6⅝*d.*	4⅝*d.*—9¾*d.* Mean 7⅛*d.*	97*s.*—126*s.* Mean 111*s.*6*d.*	139,211	509,110	58·5
Dec. 31	96⅜	4·50	52 4	3⅝*d.*—8*d.* Mean 5⅞*d.*	4⅜*d.*—8⅝*d.* Mean 6⅜*d.*	152*s.*—174*s.* Mean 163*s.*	151,709	512,286	45·0
1878 Mar. 31	95⅜	2·48	50 10	4⅛*d.*—8⅛*d.* Mean 6⅛*d.*	4⅝*d.*—9⅞*d.* Mean 7*d.*	188*s.*—212*s.* Mean 200*s.*	162,442	540,571	41·5
June 30	95⅝	2·85	50 2	4⅝*d.*—8⅝*d.* Mean 6⅜*d.*	5*d.*—9⅝*d.* Mean 7⅜*d.*	150*s.*—187*s.* Mean 168*s.*6*d.*	151,715	533,787	54·6
Sept. 30	95⅛	4·36	44 6	4⅛*d.*—8⅜*d.* Mean 6⅜*d.*	4⅝*d.*—9⅜*d.* Mean—7*d.*	120*s.*—151*s.* Mean 135*s.*6*d.*	145,956	513,616	60·8
Dec. 31	95	5·4	40 2	4⅜*d.*—7⅝*d.* Mean 6*d.*	4⅞*d.*—8⅝*d.* Mean 6⅞*d.*	111*s.*—132*s.* Mean 121*s.*6*d.*	159,721	523,996	41·6

TABLE XI.—ACREAGE under each Description of CROP, GREAT BRITAIN and

DESCRIPTION of CROPS and LIVE STOCK.	GREAT BRITAIN.		
	1876.	1877.	1878.
CORN CROPS:—	Acres.	Acres.	Acres.
Wheat	2,995,957	3,168,540	3,218,417
Barley or Bere	2,533,109	2,417,588	2,469,652
Oats	2,798,430	2,754,179	2,698,907
Rye	56,210	60,146	60,117
Beans	517,556	497,879	437,936
Peas	293,407	311,797	282,617
TOTAL CORN CROPS	9,194,669	9,210,129	9,167,646
GREEN CROPS:—			
Potatoes	502,719	512,471	508,431
Turnips and Swedes	2,145,573	2,073,455	2,031,860
Mangold	347,889	358,055	343,389
Carrots	16,129	15,953	14,711
Cabbage, Kohl-rabi, and Rape	179,475	182,710	171,773
Vetches, Lucerne, and any other crop (except clover or grass)	380,089	442,202	420,846
TOTAL GREEN CROPS	3,571,874	3,584,846	3,491,010
OTHER CROPS, GRASS, &c.:—			
Flax	7,641	7,481	7,261
Hops	69,999	71,239	71,789
Bare fallow or uncropped arable land	651,212	616,147	632,423
Clover and artificial and other grasses under rotation	4,540,273	4,494,216	4,573,107
Permanent pasture, meadow, or grass not broken up in rotation (exclusive of heath or mountain land)	13,515,944	13,728,355	13,911,296
LIVE STOCK:—	No.	No.	No.
Cattle	5,844,141	5,697,933	5,738,128
Sheep	28,182,951	28,161,164	28,406,206
Pigs	2,293,620	2,498,728	2,483,248
Total number of horses used for agriculture, unbroken horses, and mares kept solely for breeding	1,374,576	1,388,582	1,412,502
Acreage of orchard, or of arable or grass-land, used also for fruit-trees	157,287	163,290	165,415
Acreage of woods, coppices, and plantations	2,187,078*	2,187,078*	2,187,078*

* As returned

FALLOW, and GRASS, and NUMBER of CATTLE, SHEEP, and PIGS, in IRELAND, in 1876–77–78.

IRELAND.			UNITED KINGDOM, including the Islands.		
1876.	1877.	1878.	1876.	1877.	1878.
Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
119,597	143,319	154,011	3,125,342	3,321,065	3,381,701
221,263	226,603	244,504	2,762,263	2,652,300	2,722,879
1,487,086	1,471,698	1,412,637	4,298,722	4,238,957	4,124,029
8,631	10,441	10,864	64,951	70,703	71,074
10,672	8,584	8,267	528,556	506,701	446,466
1,238	1,202	1,138	295,012	313,470	284,026
1,848,487	1,861,847	1,831,421	11,074,846	11,103,196	11,030,175
880,693	871,522	846,985	1,391,885	1,392,784	1,364,508
344,721	336,201	329,942	2,500,425	2,419,296	2,372,198
48,544	48,753	45,187	397,217	407,518	389,306
3,217	3,503	3,938	19,845	19,943	19,163
40,887	47,006	46,938	220,439	229,786	218,855
45,162	47,868	44,770	427,986	492,364	468,165
1,363,224	1,354,853	1,317,760	4,957,797	4,961,691	4,832,195
132,878	123,362	111,808	140,519	130,846	119,076
..	..	..	69,999	71,239	71,789
11,652	16,678	16,971	663,363	633,495	650,238
1,861,464	1,925,168	1,942,716	6,441,184	6,460,404	6,557,748
10,507,249	10,145,227	10,124,745	24,053,273	23,903,314	24,065,394
No.	No.	No.	No.	No.	No.
4,113,693	3,996,027	3,984,751	9,995,028	9,731,537	9,761,288
4,007,318	3,989,178	4,094,230	32,262,579	32,220,067	32,571,018
1,424,143	1,467,999	1,269,340	3,734,429	3,984,447	3,767,960
479,502	496,165	504,750	1,863,410	1,894,128	1,927,066
..	..	..	..	..	..
324,152	328,413	..	..	..	..

in 1872.

TABLE XII.—NUMBER of BEASTS exhibited and the PRICES realised for them at the CHRISTMAS MARKETS since 1843.

Year.	Beasts.	Prices.				Year.	Beasts.	Prices.			
		s.	*d.*	*s.*	*d.*			*s.*	*d.*	*s.*	*d.*
1843	4,510	4	0	4	4	1861	8,840	3	4	5	0
1844	5,713	4	0	4	6	1862	8,430	3	4	5	0
1845	5,326	3	6	4	8	1863	10,372	3	6	5	2
1846	4,570	4	0	5	8	1864	7,130	3	8	5	8
1847	4,282	3	4	4	8	1865	7,530	3	4	5	4
1848	5,942	3	4	4	8	1866	7,340	3	8	5	6
1849	5,765	3	4	4	0	1867	8,110	3	4	5	0
1850	6,341	3	0	3	10	1868	5,320	3	4	5	8
1851	6,103	2	8	4	2	1869	6,728	3	6	6	2
1852	6,271	2	8	4	0	1870	6,425	3	6	6	2
1853	7,037	3	2	4	10	1871	6,320	3	10	6	2
1854	6,181	3	6	5	4	1872	7,560	4	6	6	0
1855	7,000	3	8	4	2	1873	6,170	4	4	6	6
1856	6,748	3	4	5	0	1874	6,570	4	4	6	8
1857	6,856	3	4	4	8	1875	7,660	4	6	6	6
1858	6,424	3	4	5	0	1876	7,020	4	4	6	4
1859	7,560	3	6	5	4	1877	7,510	4	6	6	0
1860	7,860	3	4	5	6	1878	6,830	4	6	6	0

TABLE XIII.—AVERAGE PRICES of BRITISH WHEAT, BARLEY, and OATS, per IMPERIAL QUARTER, in each of the SIXTEEN YEARS 1863–78.

Year.	Wheat.		Barley.		Oats.		Year.	Wheat.		Barley.		Oats.	
	s.	*d.*	*s.*	*d.*	*s.*	*d.*		*s.*	*d.*	*s.*	*d.*	*s.*	*d.*
1863	44	9	33	11	21	2	1871	56	10	36	2	25	2
1864	40	2	29	11	20	1	1872	57	0	37	4	23	2
1865	41	10	29	9	21	10	1873	58	8	40	5	25	5
1866	49	11	37	5	24	7	1874	55	9	44	11	28	10
1867	64	6	40	0	26	1	1875	45	2	38	5	28	8
1868	63	9	43	0	28	1	1876	46	2	35	2	26	3
1869	48	2	39	5	26	0	1877	56	9	39	8	25	11
1870	46	10	34	7	22	10	1878	46	5	40	2	24	4

TABLE XIV.—CERTAIN ARTICLES of FOREIGN and COLONIAL PRODUCTION IMPORTED in the YEARS 1875–78; and their QUANTITIES.

	1875.	1876.	1877.	1878.
ANIMALS, Living:				
Oxen, Bulls, and Cows, number	224,969	227,478	174,023	226,455
Calves .. .. ,,	38,729	44,098	30,172	27,008
Sheep .. .. ,,	985,652	1,041,494	874,062	892,126
Lambs .. .. ,,				
Swine and Hogs .. .. ,,	71,928	43,558	20,037	55,911
Bones (burnt or not, or as animal charcoal) .. .. tons	97,162	85,135	104,223	85,773
Cotton, Raw .. .. .. cwts.	13,324,564	13,346,739	12,112,819	11,978,288
Flax .. .. ,,	1,765,068	1,404,661	2,216,267	1,553,664
Guano .. .. ,,	114,454	210,918	152,990	178,178
Hemp .. .. ,,	1,342,466	1,170,728	1,251,458	1,224,195
Hops .. .. ,,	256,444	167,421	248,620	169,512
Hides untanned: Dry .. ,,	552,629	469,460	551,547	565,909
,, ,, Wet .. ,,	652,634	583,914	594,542	595,221
Petroleum .. .. tuns	77,661	100,175	134,096	119,169
Oilseed Cakes .. .. .. tons	180,379	190,225	163,349	201,299
Potatoes .. .. cwts.	4,696,132	6,031,341	7,969,136	8,751,174
Butter .. .. ,,	1,467,870	1,659,357	1,637,939	1,795,413
Cheese .. .. ,,	1,627,748	1,538,475	1,651,088	1,965,949
Eggs .. .. .. great hundreds	6,178,433	6,274,924	6,257,892	6,529,036
Lard .. .. cwts.	540,244	558,983	592,944	908,187
Bacon .. .. ,,	2,638,875	2,809,990	2,395,223	3,466,565
Hams .. .. ,,		349,455	423,869	797,336
Salt Beef .. .. ,,	181,504	243,342	208,364	219,445
Salt Pork .. .. ,,	232,782	350,151	295,524	369,500
Clover Seeds .. .. .. ,,	306,551	387,099	358,056	305,049
Flax-seed and Linseed .. qrs.	1,961,987	1,998,130	1,706,796	1,990,529
Rape .. .. ,,	501,350	499,218	539,263	641,261
Sheep and Lambs' Wool .. lbs.	361,133,165	385,987,842	405,949,161	395,461,286

TABLE XV.—QUANTITY and VALUE of MEAT IMPORTED in the 6 YEARS, 1873–8.

QUANTITIES.

	1873.	1874.	1875.	1876.	1877.	1878.
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
Beef, Salted or Fresh ..	260,554	261,721	215,581	413,351	678,505	723,558
Meat, ,, ,, ..	79,841	119,401	144,954	92,556	130,178	145,493
Total	340,395	381,124	360,535	505,907	808,683	869,051
Meat, Preserved otherwise than by salting	260,749	265,223	171,373	283,066	469,003	438,903
Total Meat ..	601,144	646,347	531,908	788,973	1,277,686	1,307,954

VALUES.

	£.	£.	£.	£.	£.	£.
Beef, Salted or Fresh ..	519,815	523,326	454,337	943,580	1,686,392	1,753,066
Meat, ,, ,, ..	216,681	335,846	419,019	281,830	388,933	426,864
Total	736,496	859,172	873,356	1,225,410	2,075,325	2,179,930
Meat, preserved otherwise than by salting	733,331	757,001	592,196	887,035	1,434,234	1,313,541
Total Meat ..	1,469,827	1,616,173	1,465,552	2,112,445	3,509,559	3,493,471

The quantity of meat imported in 1876 was 788,973 cwts., showing an increase of 257,065 cwts. over that in 1875. In 1877, the quantity was 1,277,686 cwts., being 488,713 cwts. in excess of that imported in 1876. The quantity imported in 1878 (1,307,954 cwts.) was slightly in excess of that imported in 1877.

This increased importation of meat has probably had the effect of reducing the recent high price of butchers' meat. The average price of beef per lb. by the carcass at the Metropolitan Meat Market was $6\frac{5}{8}d.$ in 1876; in 1877 it was $6\frac{2}{8}d.$, or 5·7 per cent. less. The average price of mutton per lb. was $7\frac{4}{8}d.$ in 1876; in 1877 it was 7*d.*, showing a decrease of 6·7 per cent.

In the number of animals imported there was a marked decrease in 1877 compared with the previous year: in oxen, bulls, and cows, of 53,455; in calves of 13,926; in sheep and lambs of 167,432; and in swine and hogs of 23,521. Comparing the number of animals imported in 1878 with the number in 1877, there was an increase in oxen, bulls, and cows in the former year, of 52,432, in sheep and lambs of 18,064, and in swine and hogs of 35,874, while in the number of calves there was a decrease of 3164.

STATISTICS OF DAIRY PRODUCE.

The following remarks relating to Butter and Cheese, are extracted from 'The Grocer':—

Butter.—The month of January began with prices many shillings below those of the two preceding years. Clonmels during this month varied only from 134*s.* to 135*s.* for the finest; but after this the quantity offered for sale was not sufficient to establish market prices till May, when they were 112*s.* to 114*s.* In June the price for Clonmels varied from 106*s.* for second-rate brands, to 112*s.* for the best; and in July from 108*s.* to 114*s.* In August there was some improvement in the demand, and the prices ranged from 112*s.* to 116*s.* in the first week, and from 108*s.* to 120*s.* in the last week of this month. In October, Clonmels ranged from 108*s.* to 126*s.*, and so continued until the second week in November, when, with a considerable falling-off in supplies of fine qualities, prices ruled from 110*s.* to 130*s.* After this, so few really fine qualities were offered for sale, that quotations were nearly nominal.

Cork Butter.—The prices of firsts, during each month of the year 1878, were as follow:—In January, 133*s.* to 135*s.*; and to first week in February, 130*s.* to 135*s.*; after this prices varied from

125*s.* to 135*s.*, until the middle of March, when the last quotation for that season's brand was 130*s.* to 140*s.* No further quotations were made until May, when the new season's brand was offered at 125*s.* in the first week, and at 110*s.* to 114*s.* in the last week. In June prices began at 111*s.*, and afterwards varied from 106*s.* to 111*s.* In July the lowest prices for firsts throughout the year were quoted, viz., 106*s.* to 107*s.* In August they ranged from 112*s.* to 113*s.*, and from 116*s.* to 118*s.* In September, prices were 117*s.* to 118*s.* In October they were 120*s.* In November, prices varied from 125*s.* in the first week, to 124*s.* to 129*s.* in the last week. In December, prices began at 124*s.* to 120*s.*

Cork Butter Market.—The past season will be long remembered by every one trading in the Cork Market, as one of the most unsatisfactory, unprofitable, and almost disastrous, in the memory of the oldest merchant. Farmers who sent their produce to Cork Market this past season suffered immensely from the low prices which ruled throughout the whole season, and the material difference of 20*s.* and 30*s.* between each quality made a "cut" in quality a ruinous loss per firkin. The exporters suffered heavily by trying during the whole season to sustain a falling market, losing considerably from day to day on stocks accumulating through want of orders. The usual reaction at the end of the season was looked for in vain this year; bad trade, bank failures, and want of confidence in the brands prevented the usual winter stocks of Cork butters being bought, and at the end of December some prices ruled in Cork as in the month of May.

Foreign Butter.—The best brands of Normandy were offered in January at 140*s.* to 148*s.*, and during the last week at 134*s.* to 142*s.* In the first week of February prices were 132*s.* to 138*s.*; then, with diminished supplies, they were at the end of the month 136*s.* to 160*s.*, and so continued to the first week in April; after that, with some new coming forward, and early growth of grass, prices rapidly fell, so that by the last week in May they were as low as 108*s.* to 114*s.* June and July closed with prices from 112*s.* to 118*s.*; but in the middle of August prices rose, and were 114*s.* to 120*s.* During the last week of August and first week of September they were 112*s.* to 120*s.*; after which they varied. In the first week in October there was a sudden advance, viz., 128*s.* to 136*s.*, and this checked sales: in the second and third weeks in October, Normandys in casks were offered at 122*s.* to 130*s.*; then to the middle of November 120*s.* to 126*s.*, and by the end of this month prices varied from 122*s.* to 134*s.* In the first week in

December prices were 122*s.* to 128*s.*, and at the end of this month they left off at 132*s.* to 136*s.* Low qualities throughout the year were offered at very irregular prices.

American Butter.—The stock has accumulated, and the demand has been so limited that disastrous losses have resulted to those principally interested in speculations. The qualities varied much, and so did the prices asked early in January. Prices ranged from 50*s.* to 120*s.*; the next fortnight, 60*s.* to 115*s.*; the following fortnight, 50*s.* to 102*s.*; then to the middle of February, 50*s.* to 100*s.*; last week in February to the second week in March, 50*s.* to 110*s.*; the following five weeks, 45*s.* to 110*s.*; middle of April, 45*s.* to 105*s.*; the end of April, 45*s.* to 100*s.*; the first week in May, 40*s.* to 90*s.*; the next fortnight 40*s.* to 70*s.*, the last week 40*s.* to 65*s.* Early in June, to effect clearances, they were offered at 35*s.* to 60*s.*; low qualities were offered the next fortnight at 35*s.*, best at 100*s.* To the middle of June quotations then varied from 85*s.* to 95*s.*; then, for three weeks, 70*s.* to 95*s.*; middle of August, 70*s.* to 95*s.*; the third week, 72*s.* to 95*s.*; then, to the end of the month, 72*s.* to 100*s.*; the beginning of September, 72*s.* to 96*s.*; then, to the end of the month, 70*s.* to 95*s.*; throughout October, 70*s.* to 100*s.*; November, 70*s.* to 105*s.*; December, 60*s.* to 102*s.*

Cheese.—Transactions were chiefly confined to the sale of American cheese, the supplies of which were unusually large. The following quotations, therefore, relate to this particular market. In January prices varied from 54*s.* to 64*s.*; to the middle of February they were 58*s.* to 66*s.*; then 58*s.* to 68*s.* in the middle of March. From then to the beginning of May they varied from 45*s.* to 70*s.*, and continued about those prices till the end of the month. At the beginning of June, the new season's make came in and prices fell heavily—the first week in June they were 50*s.* to 56*s.*; the middle of the month, 48*s.* to 50*s.*; 2*s.* more were then asked for fine qualities. Early in July they were 48*s.* to 50*s.*; the end of the month they were 45*s.* to 46*s.*; the quoted rates for the next five weeks were 46*s.* to 48*s.*; then, to the end of September, 46*s.* to 50*s.* In the middle of October holders of fine September make asked 52*s.*; after that 54*s.*, about the extreme quotation for finest for the remainder of the year. In the meantime stocks were said to have accumulated, sales of which were anxiously pressed at prices, varying according to condition, &c., from as low as 24*s.* up to 50*s.*

The following Quotations, &c., are extracted from 'The Grocer.'

TABLE XVI.—CURRENT PRICES of BUTTER and CHEESE on 1st SATURDAY in JANUARY of each YEAR, from the latest actual MARKET SALES.

	Average Annual Price in the 5 years, 1870–74.	1875.	1876.	1877.	1878.	1879.
	Per cwt.	Per cwt.	Per cwt.	Per cwt.	Per cwt.	Per cwt.
Butter:	*s.*	*s.*	*s.*	*s.*	*s.*	*s.*
Carlow, finest, F.O.B.	126 to 136	150 to 160	138 to 148	140 to 150	116 to 132	110 to 130
,, Landed ..	124 ,, 138	.. ..	138 ,, 148	.. ..	.. ..	.. ..
Cork, 1sts..	138 ,, 143	158 ,, 160	146 ,, 150	150 ,, 162	134 ,, 137	126 ,, 133
,, 2nds	129 ,, 135	151 ,, 154	136 ,, 142	140 ,, 148	122 ,, 125	114 ,, 117
,, 3rds, new ..	111 ,, 116	131 ,, 132	110 ,, 112	119 ,, 120	100 ,, 103	78 ,, 79
,, 4ths	98 ,, 98	115 ,, ..	81 ,, ..	90 ,, 91	72 ,, ..	.. ..
Limerick	117 ,, 121	.. ..	118 ,, 120	130 ,, 138	.. ..	.. ..
Foreign:						
Friesland	113 ,, 130	136 ,, 144	135 ,, 140	136 ,, 140	134 ,, 140	116 ,, 120
Jersey, &c.	79 ,, 129	94 ,, 144	80 ,, 136	80 ,, 132	125 ,, 136	90 ,, 120
Kiel	111 ,, 145	135 ,, 164	.. ..	.. ..	.. ..	.. ..
Normandy	93 ,, 150	110 ,, 160	90 ,, 162	100 ,, 150	85 ,, 148	75 ,, 136
American	82 ,, 115	112 ,, 138	90 ,, 118	95 ,, 136	60 ,, 104	50 ,, 110
Cheese:						
English Cheddar, fine, new	76 ,, 90	74 ,, 94	74 ,, 92	60 ,, 94	78 ,, 90	74 ,, 82
,, good, new	74 ,, 93	.. ..	.. ..	.. ..	.. ..	.. ..
Red Somerset Loaf..	68 ,, 81	78 ,, 88	76 ,, 86	.. ..	.. ..	.. ..
White or yellow Cheddar Loaf ..	72 ,, 81	80 ,, 88	76 ,, 86	.. ..	.. ..	.. ..
Scotch Cheddar ..	67 ,, 77	74 ,, 82	64 ,, 76	64 ,, 80	70 ,, 76	56 ,, 64
Cheshire, new.. ..	76 ,, 87	84 ,, 88	76 ,, 86	78 ,, 90	78 ,, 84	74 ,, 82
,, good ditto	58 ,, 70	70 ,, 76	50 ,, 70	46 ,, 70	60 ,, 74	40 ,, 66
Wiltshire, new ..	67 ,, 78	70 ,, 82	62 ,, 78	74 ,, 82	72 ,, 78	70 ,, 74
,, good ditto	57 ,, 64	66 ,, 68	.. ..	.. ..	64 ,, 70	50 ,, 66
North Wilts Loaf, new	66 ,, 80	78 ,, 88	74 ,, 86	.. ..	76 ,, 78	60 ,, 70
Derby ,, ,,	65 ,, 83	76 ,, 88	76 ,, 86	80 ,, ..	74 ,, 78	64 ,, 70
Foreign:						
American, fine ..	68 ,, 73	72 ,, 76	62 ,, 64	66 ,, 72	66 ,, 70	50 ,, 53
,, good ..	54 ,, 65	50 ,, 68	30 ,, 58	46 ,, 60	54 ,, 62	24 ,, 46
Gouda	49 ,, 64	52 ,, 60	56 ,, 62	50 ,, 62	56 ,, 64	48 ,, 56
Edam, new	53 ,, 68	54 ,, 64	60 ,, 70	60 ,, 68	60 ,, 66	46 ,, 56
Gruyère, new	.. ..	.. ..	.. ..	.. ..	80 ,, 90	72 ,, 80

TABLE XVII.—QUANTITY and VALUE of BUTTER IMPORTED from DENMARK, 1865–77.

Years.	Quantities.	Computed Real Value.	Years.	Quantities.	Computed Real Value.
	Cwts.	£.		Cwts.	£.
1865	65,555	362,440	1872	173,574	1,009,322
1866	67,305	319,528	1873	201,558	1,203,459
1867	80,589	422,479	1874	226,053	1,363,433
1868	79,437	471,262	1875	206,171	1,275,870
1869	103,613	574,981	1876	205,195	1,311,234
1870	127,013	767,190	1877	210,322	1,347,791
1871	140,851	803,226			

TABLE XVIII. — QUANTITY and VALUE of BUTTER Imported from the UNITED STATES, BELGIUM, FRANCE and HOLLAND; and of CHEESE Imported from the UNITED STATES and HOLLAND, 1865–77.

Years.	UNITED STATES			
	BUTTER.		CHEESE.	
	Quantities.	Computed Real Value.	Quantities.	Computed Real Value.
	Cwts.	£.	Cwts.	£.
1865 ..	83,216	437,703	442,913	1,296,204
1866 ..	16,059	77,754	415,726	1,386,447
1867 ..	39,035	113,290	526,740	1,470,017
1868 ..	7,117	37,279	489,117	1,439,380
1869 ..	17,205	84,603	487,870	1,612,325
1870 ..	16,915	80,928	555,385	1,861,263
1871 ..	83,775	394,359	731,326	2,014,805
1872 ..	45,765	199,679	598,198	1,701,435
1873 ..	43,406	199,639	790,238	2,353,181
1874 ..	36,307	188,769	849,933	2,589,776
1875 ..	40,331	205,900	958,978	2,786,027
1876 ..	118,131	593,122	936,203	2,564,977
1877 ..	188,491	920,561	1,082,844	3,129,829

Years.	BELGIUM.		FRANCE.	
	BUTTER.		BUTTER.	
	Cwts.	£.	Cwts.	£.
1865 ..	70,619	433,179	353,115	1,867,085
1866 ..	76,667	426,712	452,196	2,276,493
1867 ..	80,754	470,464	450,693	2,265,147
1868 ..	70,456	405,987	393,578	2,156,824
1869 ..	85,789	481,609	407,432	2,231,450
1870 ..	84,408	516,643	289,692	1,672,899
1871 ..	94,539	523,460	304,683	1,636,006
1872 ..	74,191	409,555	355,089	1,916,795
1873 ..	76,610	439,501	446,550	2,409,861
1874 ..	76,723	465,517	713,251	3,944,233
1875 ..	79,950	499,028	567,560	3,387,219
1876 ..	65,309	419,209	622,488	3,732,405
1877 ..	58,200	378,435	606,762	3,654,488

Years.	HOLLAND.			
	BUTTER.		CHEESE.	
	Cwts.	£.	Cwts.	£.
1865 ..	345,026	1,886,486	386,962	1,100,037
1866 ..	383,225	1,979,070	426,559	1,317,231
1867 ..	326,217	1,733,459	332,628	961,245
1868 ..	343,322	1,992,414	329,565	959,547
1869 ..	415,176	2,253,420	426,913	1,262,101
1870 ..	406,795	2,388,459	422,553	1,204,830
1871 ..	390,616	1,986,708	348,148	954,236
1872 ..	269,091	1,358,579	329,535	942,537
1873 ..	279,004	1,453,875	336,654	1,013,233
1874 ..	351,605	1,877,755	398,888	1,164,921
1875 ..	357,106	1,917,910	370,123	1,078,594
1876 ..	402,984	2,252,909	330,435	949,413
1877 ..	372,134	2,084,686	341,980	984,855

JOURNAL

OF THE

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

I.—*Report on the Farm-Prize Competition* of 1878. By Frederic Beard, of Horton, near Canterbury.

The prizes awarded were offered by the Local Committee in connection with the Meeting of the Royal Agricultural Society, held at Bristol during the year 1878, for the best-managed arable, and the best-managed dairy or stock farms in the county of Gloucester, the eastern division of the county of Somerset, and the northern division of the county of Wilts. The farms were divided into classes thus:

Class I.—For the best-managed Arable Farm of 200 acres and upwards in extent, having at least two-thirds of its area under rotation of cropping, 50*l.*; for the second best, 25*l.*

Class II.—For the best-managed Arable Farm, above 80 acres in extent, and under 200 acres, having at least two-thirds of its area under rotation of cropping, 30*l.*; for the second best, 15*l.*

Class III.—For the best-managed Dairy or Stock Farm of not less than 200 acres in extent, where the cultivation and management are chiefly directed to the production of cheese or butter, or of animal food, 50*l.*; for the second best, 25*l.*

Class IV.—For the best-managed Dairy or Stock Farm, above 80 acres in extent, and under 200 acres, where the cultivation and management are directed principally to the production of cheese or butter, or of animal food, 30*l.*; for the second best, 15*l.*

The competition was limited to tenant-farmers, paying a *bonâ fide* rent for not less than three-fourths of the land in their occupation.

The Judges were instructed to take into full consideration any special advantage which one competitor might have over another, and to withhold the prizes in the absence of sufficient merit in any of the competing farms, and especially to consider the following points of merit:—

Classes I. and II.

1. General Management, with a view to Profit.
2. Productiveness of Crops.
3. Goodness and suitability of Live Stock.
4. Management of Grass and Clover Land.
5. State of Gates, Fences, Roads, and General Neatness.
6. Mode of Book-keeping pursued.

CLASSES III. and IV.

1. General Management, with a view to Profit.
2. Productiveness of Crops.
3. Goodness and suitability of Live Stock, especially for Dairy purposes.
4. Management of Grass Land.
5. State of Gates, Fences, Roads, and General Neatness.
6. Mode of Book-keeping followed.
7 Management of the Dairy and of Dairy produce.

The entries were as follows:—

CLASS I.

	A.	R.	P.	
Arkell, William, jun. ..	710	0	0	Glebe and Townsend Farms, Hatherop, near Fairford, Gloucestershire.
Corner, Richard	512	0	0	Inglescombe, near Bath, Somersetshire.
Hulbert, Thomas Redman	1343	0	0	North Cerney, near Cirencester, Gloucestershire.

CLASS II.

In this Class there were no entries.

CLASS III.

	A.	R.	P.	
Beaven, James	226	0	0	West Leaze Farm, Swindon, Wiltshire.
Gibbons, George	384	0	0	Tunley Farm, Bath, Somersetshire.
Harding, Joseph	216	1	24	Slimbridge, near Stonehouse, Dursley, Gloucestershire.
Howell, Henry	201	0	0	Woodcot Farm, Owlpen, Dursley, Gloucestershire.
Keen, John Reynolds ..	325	0	0	Chewton Farm, Stone Easton, Bath, Somersetshire.
Maskelyne, John	272	0	0	Hankerton, Malmesbury, Wiltshire.
Paget, Edward	233	0	0	Burnett, near Bristol, Somersetshire.
Pearce, James	373	0	4	Kingsweston, near Bristol, Gloucestershire.
Savage, George	200	0	0	Frocester Farm, Stroud, Gloucestershire.
Steeds, Albert James ..	222	3	20	Stratton-on-the-Fosse, Bath, Somersetshire.

CLASS IV.

	A.	R.	P.	
Cadle, John Cornelius ..	136	0	0	The Brook, Westbury-on-Severn, Newnham, Gloucestershire.
Day, Robert Alfred ..	180	0	0	Ubley, Bristol, Somersetshire.
Harding, Stephen	170	0	0	Park Farm, Bower Ashton, Bristol, Somersetshire.
Hoddinott, James	127	0	0	Lipyeat, Bath, Somersetshire.
Long, John William ..	126	0	0	Kellaways Farm, Chippenham, Wiltshire.

Mr. Thomas Willis, jun., Mr. T. F. Jackson, and myself, were appointed to act as Judges in the competition by the Council of the Royal Agricultural Society. We met for the first time at Bristol on the evening of the 21st day of January, were introduced to each other by Mr. Jenkins, the Secretary of the

Society, and were furnished by him with the foregoing and other necessary information.

We started on our tour of inspection the next morning, and although the weather was decidedly unfavourable for such work, we managed to keep all our appointments, and to complete our survey of the farms according to our programme on the 29th day of the same month, when we parted from each other at Gloucester, having previously arranged the date of our next survey.

This first visit was principally devoted to the inspection of the live stock in the yards and on the farms, of the state of the fields cropped in the autumn, and of the roots grown in 1877 that were not consumed, regard being also paid to the preparation of the land for the spring sowing of cereals, roots, and other crops.

Our next meeting was at Gloucester on the 20th of May, and we commenced our inspection on the following morning, reversing the order in which the various farms had been previously visited, making a most careful survey of everything we deemed important on each farm, and finishing at Bath on the 30th of the same month. With only one exception, it rained at intervals every day; these and previous rains had made the land very wet, low-lying and clay fields having suffered severely, and all the corn crops being more or less injured by the superabundant moisture.

We agreed in opinion that we had never seen such heavy crops of meadow and artificial grasses; and that although the stock and dairy farms had in some instances suffered much from the poaching of the cattle and consequent waste of grass, particularly near the gateways, which were simply a mass of mud, nevertheless, on the whole, the occupiers of these descriptions of farms had a good prospect of a profitable return on their investments. During this and our former visit to the competing farms, and in our journeys to and from them, we were much impressed by the fact that nearly all the cattle we saw were either Shorthorns, or crosses of that valuable breed, more or less distinct. The exceptions were here and there a white-faced animal—whose ancestry was evidently traceable to the Herefords,—an occasional blue roan—whose dam was Welsh,—and a few Devons of a very moderate class. In all the cases that came under our immediate notice, the bulls used were Shorthorns, and when they were from pedigree herds, and the animals of even only moderately good form, excellent results were clearly traceable in the young stock. The use of pure-bred males cannot be too much impressed on the owners of cows in the important dairy districts which it has been our lot to visit; and we feel confident that the small

extra cost thereby incurred would be amply repaid, and with good interest, in each individual case, while the improvement in the cattle of the district would be a national benefit.

The third and last survey was confined to a few farms only, and was made simply to clear up some points affecting our decisions, upon which we felt we required some further knowledge: it was made immediately before the Show, to enable us to deliver our awards in time for the General Meeting of the Society at Bristol, on Thursday, the 11th of July, and the results will be found in the following Report.

Class 1.—First Prize.

North Cerney, Perrot's Brook, and Scrubditch Farms, in the County of Gloucester.—These farms are occupied by Mr. Thomas Redman Hulbert; the two former are rented of Earl Bathurst, under a yearly tenancy, and the latter of Mr. Croome, under a lease, five years of which are unexpired. They are situated on and at the foot of the Cotswold Hills, about 4 miles from Cirencester.

Earl Bathurst's farms consist, according to Mr. Hulbert's entry, of—

	A.	R.	P.	
	831	3	39	Arable land.
	192	2	33	Pasture.
Mr. Croome's, of	185	1	16	Arable land.
	58	1	31	Pasture.
Total	1268	1	39	

The soil is described by Mr. Hulbert, in his certificate, as light, and the subsoil as stone-brash.

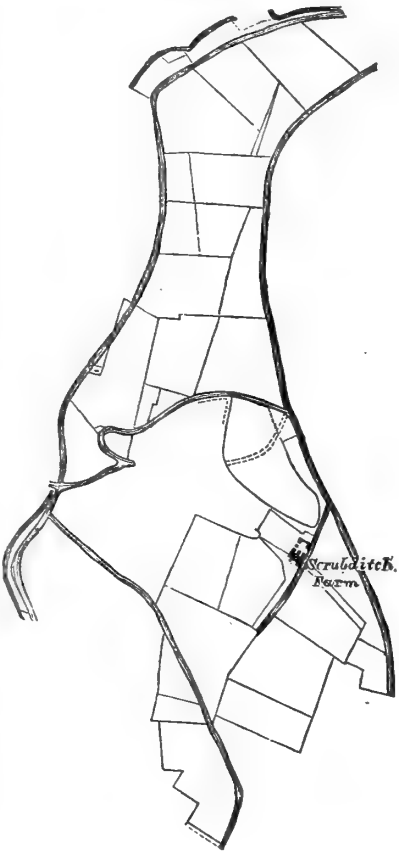
There are ten cottages hired with the farms, and two under a different hiring.

The farmhouse at North Cerney is prettily situated; the farm-buildings are an unconnected lot, some on each farm, and are of a very ordinary type. The tenant has a water-mill on the farm, which he uses for grinding, crushing, and winnowing corn, and other purposes. The late Earl Bathurst, about a year ago, at his own cost, affixed a set of pumps to force water from a well close to the wheel, through 2½-in. iron pipes, a distance of about 2 miles, to a tank holding 7000 gallons, at an elevation of about 240 feet above the level of the valley, and thence supplying other smaller tanks by gravitation, so that the buildings and every field on the farm can have a proper supply. The water from this source is also supplied to the cottages.

Considering the elevated position of the greater part of

Mr. Hulbert's occupation, and the fact that he uses steam-power largely for the purposes of cultivation, and keeps a large flock on the uplands during the summer months, this work is a great boon to him, as well as being a permanent improvement to the estate.

Fig. 1.—*Scrubditch Farm, Gloucestershire.*



Mr. Hulbert's labour costs him on an average of years about 25*s.* per acre. At present he pays his men 12*s.* per week; shepherds and carters, &c., 14*s.* to 15*s.* per week, and 40*s.* extra for harvest. Nearly all the labour, however, is performed by piecework, under which system he finds that he gets his work well done, while the men earn better wages and are better satisfied. A large sum is expended annually in food for stock, and also for artificial manure, principally nitrate of soda and superphosphates.

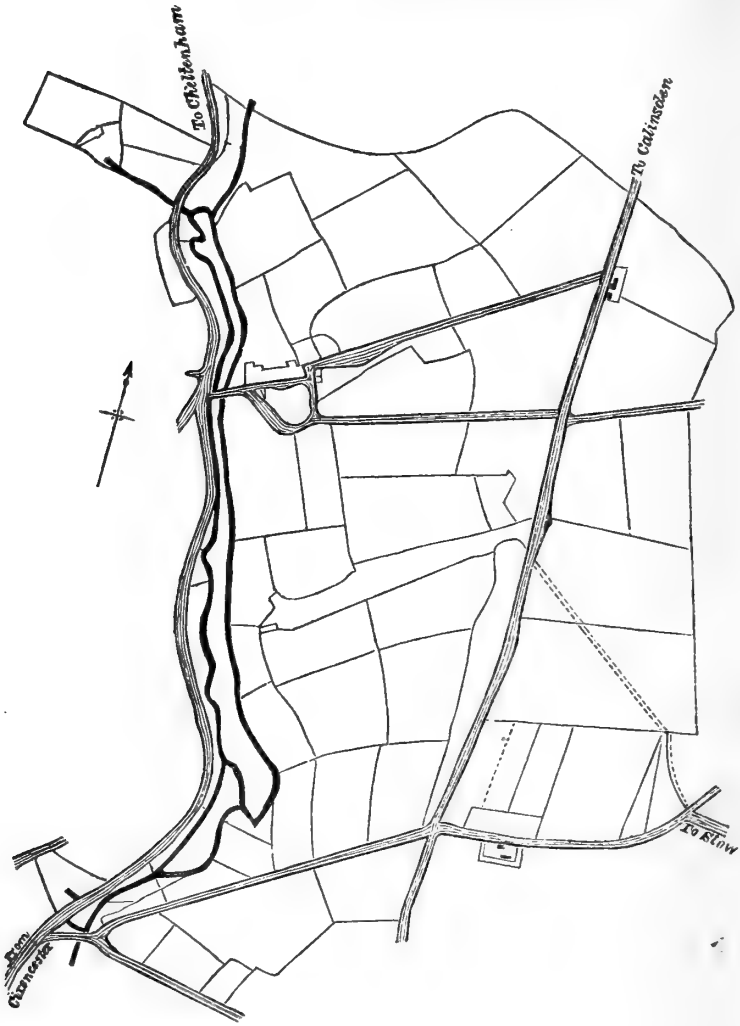
Cattle.—The cattle on the farm at the date of our first visit consisted of 12 cows, 4 bulls, 10 heifers in-calf, 2 weaning-calves, and 88 steers and fatting beasts.

Although changes had taken place between then and our next visit—fat cattle having been sold and others purchased, and calves bred and weaned—the stock was represented by about the same number.

They were, on the whole, a good lot, well done and well managed; there were some pure Shorthorns among them, and the rest had good crosses of pure blood.

Sheep.—The flock of pure Cotswolds numbered in January, 323 breeding-ewes, 188 ewe tegs, 387 tegs; and in May, 271 breeding-ewes with their lambs, 180 ewe tegs, 16 ram tegs, and some fatting sheep. The whole were good and wonderfully well managed; and Mr. Hulbert's accounts showed a very large return for mutton sold.

Fig. 2.—*Perrot's Brook Farm, Gloucestershire.*



Swine.—These are of the Berkshire breed, and of very good quality. 13 breeding-sows are kept on the farm, and in January we found 125 store-pigs.

Horses.—The farm is worked by 24 cart-horses, aided by steam-cultivation, Mr. Hulbert having a set of steam-tackle of his own, which he also hires out to his neighbours; there are

also 3 yearling cart-colts, 3 nag horses, and a pony kept on the farm.

A large number of poultry is reared at a profit, but no separate account is kept of them.

The arable land is farmed on the four-course system. The fences are principally stone walls, well-built and in good condition; the fields are large and admirably suited for steam-cultivation, the benefits of which were visible in the state of the corn crops and fallows after the long-continued rainfall that had preceded our second visit.

Mr. Hulbert's return from the sale of beef, mutton, and pork exceeds that entered under the head of corn sold by nearly one-fourth, and this we take to be the reason of the flourishing appearance of his corn crops.

The water-meadows are a great feature on this farm; their extent is about 50 acres, they are well cared for and a very valuable addition to the farm.

Mr. Hulbert plants the "Thousand-headed Kale" largely, approving of it very highly for early autumn and spring feeding. That for autumn feeding is planted thick, to facilitate its growth.

At our visit in July we found the corn crops much improved, the forcing weather having done wonders in maturing them. This year the corn crops consist of about 200 acres of wheat, 90 acres of barley, 140 acres of oats, 20 acres of peas, and 20 acres of vetches. Nearly all these were looking well, and some were very heavy crops. Mr. Hulbert is particular in his selection of varieties of seed-corn, and the growing crops bear evidence of the good results of his care in this respect.

The crops of hay were good, about 100 acres of meadow-land and 90 acres of artificial grasses had been cut, and the bulk secured in capital condition. All had been cut by the scythe, at prices varying from 3*s.* to 5*s.* per acre. There was a capital prospect of a good root-crop on this farm, so that altogether the tenant has a good look-out for the winter for a large number of live stock.

The roots consisted of about 18 acres of mangolds, very thriving; 12 acres of "Thousand-headed Kale," growing fast and looking like making a great crop; an additional 10 acres had also been planted, and the crop in this field had been mixed with Tankard turnips for early feeding. There were also about 80 acres of swedes and 35 acres of turnips planted; and in addition to these crops there were 8 acres of drumhead-cabbages, and 40 acres of land prepared for a crop of late turnips.

The swedes were an excellent plant, well drilled and well managed. These were in process of thinning and hoeing by

women, who were doing the work well, at a cost of 8*s*. per acre for two hoeings.

Everything on this farm is evidently done with a view to a profitable return on the outlay, and bears evidence of the constant supervision of the master.

The land, on the whole, is clean and well farmed, the gates, walls and fences in proper condition; the live stock is very good, and well suited for the occupation.

Keeping in view our instructions, we had therefore much pleasure in awarding the First Prize in Class 1 to Mr. Hulbert.

Class 1.—Second Prize.

The Glebe and Townsend Farms, Hatherop, near Fairford, Gloucestershire.—These farms are occupied by Mr. William Arkell, junior, under a lease for 16 years from Michaelmas 1870, and consist, according to Mr. Arkell's entry, of—

	A.	R.	P.	
	486	0	1	Arable land.
	223	0	15	Pasture.
	1	2	34	Buildings.
Total	710	3	10	

The Rev. P. P. Davies is the owner of the Glebe Farm, and Thomas S. Bazley, Esq., the owner of the Townsend Farm, but both are held by Mr. Arkell under one lease. These farms are close to the village of Hatherop and the mansion of Mr. Bazley, and about 3 miles from Fairford in Gloucestershire. The soil is described by Mr. Arkell in his certificate as part light and part heavy, and the subsoil as mostly stone under the light part and clay under the heavy.

There are only two cottages hired with the farms, but four others are held by Mr. Arkell under a different hiring. The farm-house and buildings are good, and very suitable for the occupation; they are built of stone in a substantial manner. A large Dutch barn has been built by the tenant, the landowner finding the timber; this is a very good addition to the otherwise well-arranged and commodious homestead.

The farm premises and some of the fields are supplied with water from a well, and pumped by a water-wheel, which also supplies the mansion and the cottages in the village; the water being furnished by Mr. Bazley to his tenantry and the cottages free of cost.

The cottages in the village and on the estate are wonderfully good and pretty, recently built very substantially of stone, and in

pairs; they have good gardens, beautifully kept, and are let at rents varying from 3*l.* 10*s.* to 5*l.* per year, of course paying, in a money point of view, a very small interest on the outlay to the spirited owner of the property, but who, we trust, reaps his reward in the gratitude of his tenants and in constantly seeing one of the prettiest villages in the country close to his mansion.

Mr. Arkell expends in labour about 24*s.* per acre in an average of years, paying his labourers weekly wages varying from 13*s.* to 15*s.* per week; while the carters and other weekly men get from 15*s.* to 18*s.* per week, with cottages rent-free; women are paid 10*d.* per day in winter, and 1*s.* per day in summer. No beer or cider is allowed to the men except during the corn and hay harvest, and then 1 gallon per day each.

Mr. Arkell spends a large sum annually on food for stock, equal, in fact, to the amount of his rent, but he uses scarcely any purchased manures.

Cattle.—At the date of our first visit the cattle consisted of 16 working oxen (somewhat of a novelty in these days), 8 dairy cows, 2 fatting cows, 5 three-year-old heifers in-calf, 4 fatting heifers, 7 two-year-old heifers in-calf, 5 two-year-old heifers, 25 yearlings, 11 yearling bulls, 2 older bulls, and 7 weaning-calves; at our second visit, the fatting cattle had been sold, and the weaning-calves increased in number to 23.

The cattle are a very useful lot of Shorthorns; the 2 old bulls are used with the working oxen on the farm.

Mr. Arkell sells bull calves at Birmingham and elsewhere, hence the number of young bulls on hand; he exhibits occasionally at local Shows, and evidently intends endeavouring to make himself a name in the Shorthorn world.

Sheep.—The flock of Oxford Downs in January consisted of 276 breeding-ewes, 100 ewe tegs, 4 rams, and 153 fatting sheep. At the date of our second visit we found 182 breeding-ewes, 97 ewe tegs, 296 lambs and 7 fatting sheep.

Some of the ewe tegs had lambs by their sides, and although the lambs were young, they with their mothers were looking healthy and well. Mr. Arkell sells about 50 ram lambs yearly, at an average price of 5*l.* each.

This flock has been carefully selected, and is certainly well managed. The plan adopted for feeding the sheep is to fold them on the arable and pasture land all the year round.

Swine.—Only a small number are kept, and these principally for breeding purposes. The sows are a useful lot.

About 24*l.* per annum is realised from the sale of poultry.

The farm is worked by 12 horses, the 16 oxen and the 2 bulls. There are 2 colts bred on the farm and 2 nag horses kept. The horses are a fair class of agricultural animals.

Mr. Arkell manages the light portion of his farm on the four-course system, the heavy land on a double four-course, *i.e.*, clover only once in 8 years, substituting for it vetches and fallows.

About 130 acres of land has been laid down to grass since 1870, the intention being to add to the extent of the park. The soil seems suitable for grass, and although it is perhaps some of the best land on the farm, it will, we think, be as profitable to the tenant as if it were under cultivation as arable land.

At our second visit we found the corn crops suffering very much from the excessive wet; weeds were rather more plentiful than we could have wished, and the fallows were in a backward state; but, taking the farm as a whole, and considering the exceptionally wet month that had preceded our visit, there was no very great fault to be found.

Mr. Arkell produces a large quantity of beef and mutton, the returns from the sale of animal food being nearly equal to that of the corn sold. The corn is for the most part drilled, wheat 6½ to 8½ inch intervals between the rows, at the rate of from 6 to 8 pecks per acre. Barley and oats are drilled at 6½ to 7½ inches between the rows, and at the rate of from 2½ bushels to 3 bushels per acre. Beans, when in wide rows 22½ inches, and when in narrow rows, 8 inches apart, and at the rate of 3 bushels per acre.

The mixtures sown for seeds are, clover, 10 lbs., hop clover, 6 lbs.; and for mixed seeds, 4 lbs. red clover, 4 lbs. cow grass, 4 lbs. hop clover, and ½ bushel of rye-grass.

At our last visit we found the corn crops improved, but not to so great an extent as we could have wished. One field of winter oats was a great crop, and the wheat on the whole promised well. The barley crop was not looking right, and could not by any possibility be a large one. Beans and peas were good, but showed too many weeds. Mangolds and swedes were a good plant, the latter quite fit to set out. On the whole, this farm shows evidence of previous good management, but the wet spring had been too much for the crops and for the usual staff of labourers to keep them clean.

Mr. Arkell had got together 120 acres of meadow and artificial grasses—a great crop in 7 stacks—in capital order; it had all been mowed by scythe, at a cost of from 3*s.* to 5*s.* per acre, and an elevator had been used to put it on the stacks.

Although we saw some things to find fault about on this farm, we nevertheless saw much more to commend, and, taking into account our instructions and the merit shown in many points, we had the pleasure of awarding the Second Prize in Class 1 to Mr. Arkell.

Class 1.

Manor Farm, Inglescombe, near Bath, Somersetshire.—This farm is occupied by Mr. Richard Corner, who resides at Williton, near Taunton. It is held under H.R.H. the Prince of Wales for a term of 21 years, and is situated about 2½ miles west of Bath, in a very hilly district.

It was entered in the certificate as containing—

	A.	R.	P.	
	410	0	0	Arable land.
	102	0	0	Pasture land.
Total	512	0	0	

exclusive of buildings, cottages, gardens and woods. The nature of the soil is described as moderately light, mixed with Bath stone, and a good part of it sticky yellow clay, the subsoil is stated to be rock and clay. There are 12 cottages hired with the farm, including a blacksmith's and a carpenter's house. New farm-buildings have been erected at a large outlay, and at the date of our second visit, the foundations of a new residence had been laid.

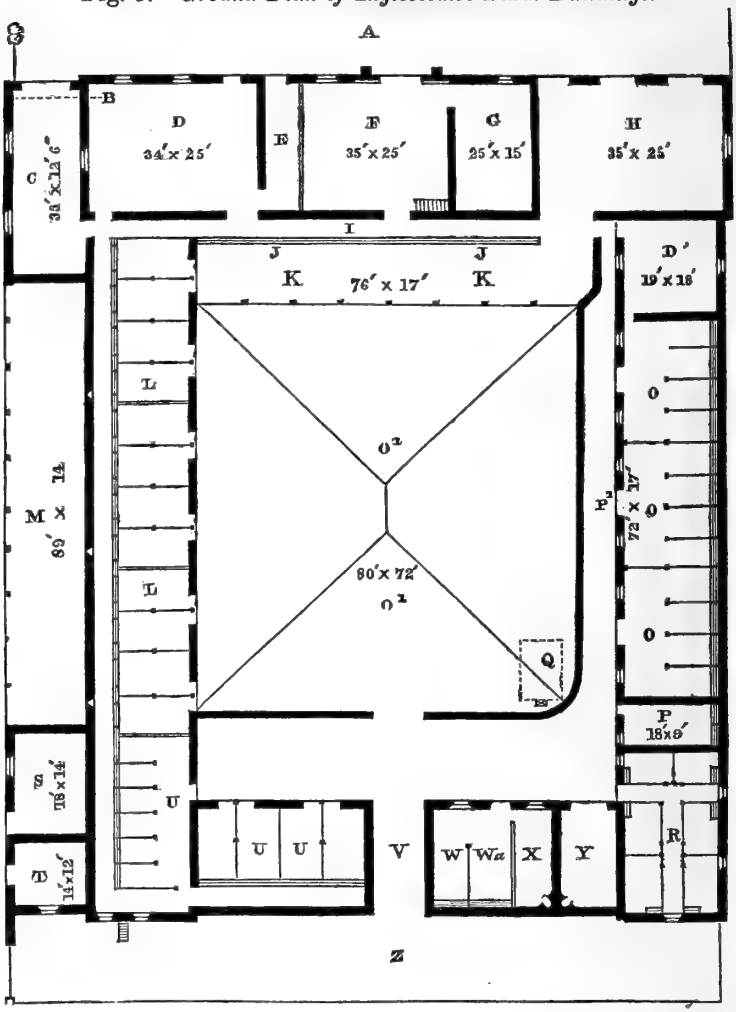
On p. 12 is a plan and description of the new farm-buildings, which are built in a very substantial manner, and, with a few exceptions, possess very commodious arrangements. There is also a new water-wheel, which performs the threshing, grinding, and chaff-cutting on the farm. It is, however, about 1000 feet from the buildings, and the power is transmitted from the wheel to the buildings by shafting running along the surface of the ground for the whole distance; this arrangement appeared to us costly and wasteful.

Mr. Corner expends in labour about 25*s.* per acre: he employs 16 men, at wages varying from 14*s.* to 18*s.* per week; 1 woman, at 1*s.* per day; and 6 boys, at from 5*s.* to 8*s.* per week: he also employs extra labour when required. Beer is allowed during corn and hay harvest. The labourers are charged 2*s.* per week rent for their cottages. A considerable sum is expended in food for cattle and also in artificial manures.

Cattle.—At the date of our first visit the cattle consisted of 11 cows and heifers, 12 fatting steers, 6 two-year-old heifers, 24 yearlings, 5 weaning-calves and 1 bull.

These were a useful lot, and the 12 fatting steers were very good. The cows are kept to breed and bring up calves, each cow is expected to bring up 5 calves in the year, four of which are of course purchased. The cattle and young stock at both our visits were in good condition and evidently well taken care of.

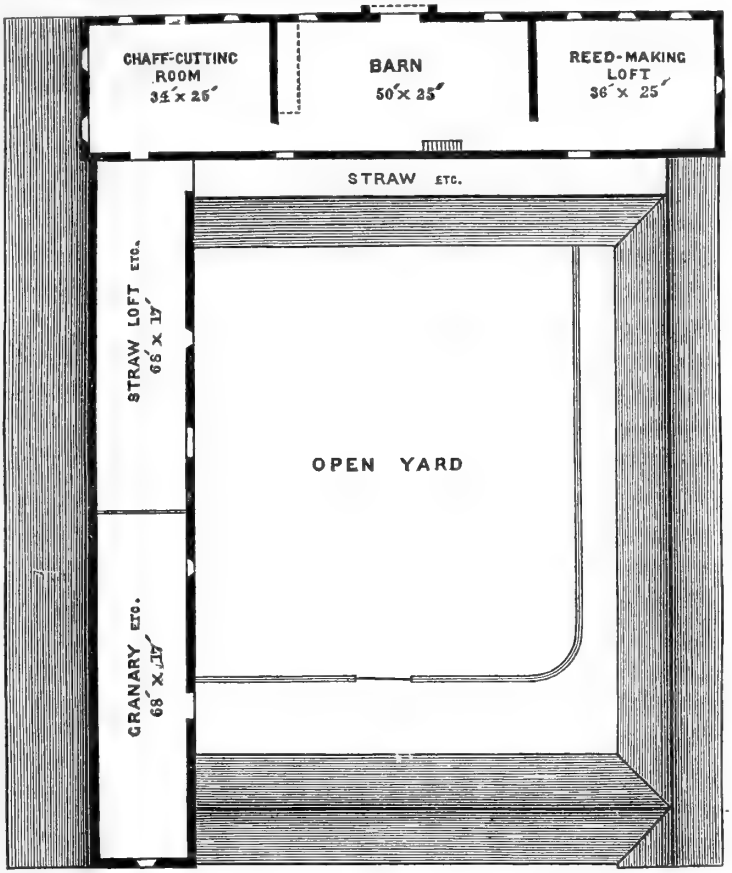
Fig. 3.—*Ground Plan of Inglescombe Farm Buildings.*



PLAN.

A. Rickyard.
B. Shafting for water-wheel.
C. Roots, &c.
DD. Chaff-house.
E. Dust-house.
F. Barn.
G. Mill.
H. Waggon-shed.
I. Feeding-path.
JJ. Crib.
K. Open shed.
LL. Fattening-boxes.
M. Carts, implements, &c.
N. Yard.
OO. Stabling for 12 horses.
P. Box.
Q. Manure-tank.
R. Calves.
S. Manure.
T. Tool-house.
UUU. Cow-stalls.
V. Entrance.
W. Stall.
W*a* Stable.
X. Harness.
Y. Gig-house.
Z. Roadway.

Fig. 4.—*First Floor Plan of Inglescombe Farm Buildings.*



Sheep.—A cross-bred flock is kept, consisting of, at our first visit, 248 breeding-ewes, 83 ewe tegs, 82 wether tegs, 30 fatting sheep, 38 small tegs, and 3 rams; in all, 650: these were reduced on our second visit to 419; but the increase in the shape of lambs made the total number about the same.

Twelve cart-horses are used to cultivate the farm; they are very good animals, well suited for the work they have to perform, and are kept in good condition. There are also 2 yearling colts and 1 cob kept on the farm.

Mr. Corner exhibited his farm under great disadvantages, the whole of it, including the shape of the fields and the buildings, having been in a state of transition since the commencement of his occupation.

It appears that about $6\frac{3}{4}$ miles of hedges have been grubbed. and about 240 rods of new fencing substituted where required, The land has come into his occupation at irregular intervals, some not more than a year since, and in wretched condition, so that he has not really had time to complete his alterations, or get the land in order.

In those portions of the farm where the improvements are completed the management and crops were very satisfactory, and we had the pleasure of seeing a growing crop of 109 acres of wheat more promising than any we had seen elsewhere.

At some future time, should Mr. Corner enter his farm in competition, we think he will have a fair chance of success.

In concluding our Report on the arable farms we would remark that, considering the large district over which the competition extended, we were somewhat surprised to find so very small an entry. Although the district is for the most part a dairy and grazing one, there is, nevertheless, a considerable extent of arable land in some portions of it; and it would have afforded us much more satisfaction if the entries from which we had to select the prize-takers had been more numerous. Without wishing in any way to depreciate the excellent points of management seen in the competing farms, we are disposed to think that in all probability a larger competition would have had the effect of making the weak points in them far more manifest to us.

No doubt there are many well-managed arable farms in the district qualified to compete in Classes 1 and 2 with good chances of success; but of one thing we are quite certain, that those who did enter their farms contrast very favourably with their immediate neighbours in the cleanliness and bulk of their crops, and in their general management.

We have avoided entering into a detailed account of the modes of cultivation practised on these farms, contenting ourselves by describing the general system pursued, and only remarking on any novel departures from the well-known modes of cropping land which are adopted under any of the ordinary and equally well-known courses of husbandry. We were much impressed by the small sum expended in labour on these farms, and, if we may venture to say so, are of opinion that a larger amount might be profitably and advantageously employed.

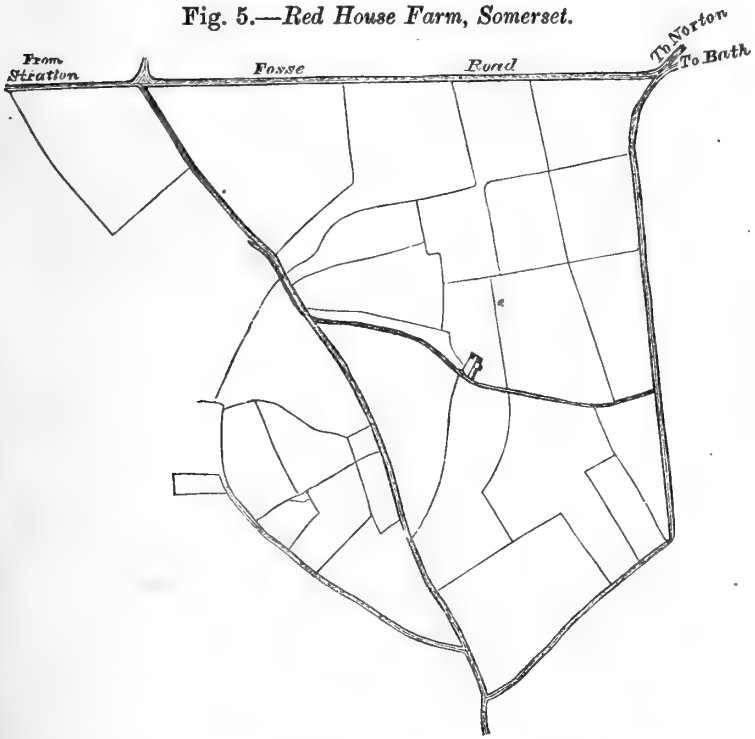
Class 3.—First Prize.

Red House Farm, Stratton-on-the-Fosse, near Bath.—This farm is the property of the Right Hon. Lord Hylton, and is occupied

by Mr. Albert James Steeds under a yearly tenancy. It contains, according to Mr. Steeds' entry,—

	A.	R.	P.	
	54	3	25	Arable land.
	168	0	1	Pasture land.
Total	222	3	26	

Fig. 5.—*Red House Farm, Somerset.*



Mr. Steeds, in his certificate of entry, describes the soil as light and the subsoil as stone-brash. The farm is situated under the Mendip Hills. The rocky subsoil is pretty close to the surface over a great portion of this farm, which has been held by the present tenant and his uncle for many years. The house and buildings are certainly not of an attractive character, and are not sufficiently capacious for a farm managed as this is, and evidently has been for a very long period. The fields are divided by earth-banks and hedges planted thereon, the banks being

for the most part protected by stone walls on one or both sides. These walls are well constructed, make a capital fence, afford good shelter for the stock, and are maintained in excellent order. The bulk of the water-supply for the stock in the buildings, and also in the fields, has to be pumped by hand-power, which is an inconvenient and expensive mode of furnishing the large quantity required on a farm carrying so many cattle as this does. For want of sufficient yard and shed accommodation, many of the cattle have to lay out in the fields during the whole of the winter. They are of course fed with artificial food, and although the fences above alluded to are a great protection to them, they must nevertheless suffer much for want of proper shedding and from lying on the damp ground. There must also be a waste of food. When we were on the farm in January it was during a severe hail- and snow-storm, and the poor animals, although well cared for in the matter of food, were certainly not looking their best. Notwithstanding these disadvantages, the tenant had evidently made up his mind to make the most of the good qualities of the farm, and has certainly succeeded in doing so, the condition of his cattle, and the good order and cleanliness of his belongings testifying most fully to this fact.

There are three cottages on this farm.

The labour costs about 30*s.* per acre, the men being paid at the rate of 14*s.* per week ; they have also allowed them 20 perches of potato-land, cultivated ready to receive the seed, and also one quart of cider per day.

All the fodder grown on the farm is consumed thereon, and in addition a sum equal to the rent of the farm is laid out in purchasing food for the stock.

The returns in the shape of animal food and dairy produce are immense, doing the utmost credit to Mr. Steeds' management.

Cattle.—At our first visit in January we saw on the farm 46 cows in-calf, 3 barren cows, 11 two-year-old heifers in-calf, 13 yearling heifers, and 2 bulls. At our second visit in May, 61 cows in-milk, 13 yearling heifers, 2 bulls, and 13 weaning-calves.

The cattle are useful, rent-paying dairy stock, well cared for, and consequently kept in nice condition.

As cheese is the object sought after, the cows are calved early in the spring, the calves being sold under a week old, with the exception of about a dozen of the most promising females, which are weaned and go into the dairy when a little over two years old.

Mrs. Steeds manages the dairy very well, and a detailed account of the mode of management on this and the other farms will be seen in my colleague's Report (pp. 37–42).

Sheep.—The flock in January consisted of 117 breeding-ewes and 3 rams; and in May, 127 ewes and 111 lambs. The ewes are West Country Downs; Mr. Steeds' plan is to buy in ewes every year, tup them with Cotswold rams, selling the ewes and lambs fat. At the date of our May visit, 53 lambs had been sold and several others were ready for the butcher; the ewes were also in a forward state, and would be sold fat during the summer, to make way for a fresh lot.

Swine.—Seven breeding-sows are kept on the farm. The pigs are fatted in the usual manner practised among cheese-making farmers, viz., with whey and meal. In Mr. Steeds' case a very large quantity of pork is sold annually, helping much to swell his large gross returns.

Horses.—The work of the farm is performed by 3 horses; there are also 2 nags kept. The farm-horses are an exceedingly useful lot, 2 of them good brood-mares.

The arable land is managed on a four-course system, and is very well done, being free from weeds and in a very high state of cultivation. The course is, (1) roots, (2) wheat, (3) barley, and (4) seeds.

With such high farming as we saw here, this deviation from the ordinary four-course system seemed to us absolutely necessary to secure a plant of seeds under the growing crops of corn.

The accounts are fairly kept; in fact, better so than in most of the cases that came under our observation. Taylor's 'Farmer's Account-book' is used, and a profit and loss account shown therein every year. Everything under Mr. Steeds' management shows unmistakable proofs of the interest he takes in his business; and although his buildings, his gates, and fences were models of neatness and good order, and his land remarkably clean, nevertheless it was evident that the main chance was always kept carefully in sight. The farm is also very well and fully stocked, and the annual returns in the shape of dairy and other produce the largest per acre of any that came under our notice. Keeping our instructions in view, we were all of opinion that this farm was entitled to first honours, and we had consequently very great pleasure in awarding Mr. Steeds the First Prize in Class 3.

Class 3.—Second Prize.

Tunley Farm, near Bath, in the County of Somerset.—This farm is the property of Miss Jarrett, of Camerton Court, and is occupied by Mr. George Gibbons, under an unexpired term of lease. It contains 100 acres of arable and 284 acres of pasture land; total, 384 acres.

The soil is described as mixed, mostly heavy, and the subsoil various, but mostly clay,

The house and main portions of the buildings are on nearly the highest portion of the farm. The new buildings are good, the new cow-house being the best arranged of any we saw during our inspection.* The mode of supplying the animals with food, litter, and water, and of getting rid of the manure, liquid and solid, is excellent, and does great credit to the designer. The liquid manure is conveyed by pipes to a tank some distance from the buildings, and is used for irrigating some lower-lying pasture-land. A small fixed steam-engine is used for chaff-cutting and crushing corn, &c.

The land is of very undulating character, of good fair quality, and the farm, as a whole, possesses many advantages. The cottages and farm-buildings at the lower end of the farm are rather a sorry lot: Mr. Gibbons accounts for this by stating that he would rather have only one homestead, and therefore simply keeps the sheds here for young cattle and swine.

There are 6 cottages, 3 of which are held with the farm, and 3 under a different hiring.

Mr. Gibbons pays about 30*s.* per acre annually for labour, and expends a sum exceeding a year's rent of his farm upon purchased food for his stock. He pays his men at the rate of from 14*s.* to 15*s.* per week, allowing them 1 quart of cider per day, from Lady-day to Michaelmas, and extra for harvest.

The cows are milked by women, who are paid 3*s.* per week for milking night and morning.

The returns in the shape of pork and dairy produce are large. Mr. Gibbons informed us that he fattened annually about 200 pigs, at an average weight of 200 lbs. each.

Cattle.—At our first visit, in January, there were on the farm 76 cows, 16 two-year-old heifers in-calf, 24 yearling heifers, and 2 bulls; and on our second visit, 77 cows in-milk, 5 cows in-calf, 24 yearling heifers, 3 bulls, and 33 weaning-calves.

Sheep.—45 breeding-ewes, 63 ewe tegs, 14 wether tegs, and 2 rams.

Swine.—12 breeding-sows, 140 store and fatting pigs.

Horses kept on the farm consist of 7 cart-horses and 4 cart-colts, 2 nag colts, a pony, and a cob.

A large quantity of poultry is reared, but no separate account of the returns from this source is kept.

The dairy cows, particularly the young ones, and also the yearlings and weaning-calves, are a very superior lot, affording

* For illustrations of these buildings and a detailed description of the farm, see the 'Report on the Somerstshire Farm-Prize Competition, 1875,' pp. 529 to 543 of vol. xi., Second Series, of this 'Journal,' 1875.

in their appearance ample evidence of the good results due to the use of pure Shorthorn bulls. Those at present in use are well-shaped animals of good quality, bred by Mr. Hugh Aylmer, of West Dereham, Norfolk.

Mr. Gibbons farms for cheese and pork, and evidently does so successfully. The dairy is well managed by Mrs. Gibbons; the mode of cheesemaking and other details of management is described in Mr. Jackson's Report.

The arable land is managed on the four-course system, viz., (1) roots, (2) barley, (3) seeds, (4) wheat. We found the land and also the pasture in a very fair state of cultivation, one large field of wheat being exceedingly good, and the crops of seeds and grass-hay very heavy. There was also a good plant of mangolds, and these were in a clean state and looked promising. Peat's 'Farmer's Dairy and Account-book' is used, but we can hardly compliment Mr. Gibbons on the manner in which the accounts were kept. The house and buildings are supplied with water by a hydraulic ram raising water to a tank holding about 6000 gallons. The tank is at an elevation of about 200 feet above the ram, which is capable of lifting between 3000 and 4000 gallons of water daily. The reservoir, from which the water is taken to work the ram, is built in masonry and supplied by a strong natural spring, the surplus water being used for irrigating a meadow nearly adjoining the same.

At our third visit to this farm we found that Mr. Gibbons had secured the produce of 103½ acres of meadow land, and 16½ acres of seeds in capital condition. The crop was large, and the work had been very well done with the aid of Harrison and McGregor's mower, Boby's haymaking-machine, and Nicholson's horse-rake. The crops on the arable land were looking well; they consisted of 31 acres of wheat, promising to be a great crop; 5 acres of barley, also good; and 22½ acres of roots, a good plant, and the land clean and well done.

Acting according to our instructions, we had, after our third survey, no hesitation in awarding the Second Prize in Class 3 to Mr. Gibbons.

Class 3.—Extra Prize Farm.

Brook Farm, Hankerton.—This farm is situated about 4 miles north-east of Malmesbury, in the county of Wilts, and is the property of the Earl of Suffolk. According to the certificate of entry, it contains—

	A.	R.	P.	
	80	0	0	Arable land.
	192	0	0	Pasture land.
Total	272	0	0	

The tenancy is a yearly one, with a Lady-day entry, and the farm is occupied by Mr. John Maskelyne, who in his certificate of entry describes the nature of the soil as heavy and the subsoil as principally clay. The house and buildings are well suited to the occupation. There are 3 cottages, and 8 labourers are employed on the farm, at wages varying from 12*s*. to 15*s*. per week; the labour on the whole costing about 30*s*. per acre. Mr. Maskelyne does not use this farm as a dairy-farm, finding the soil not suitable for the production of cheese of good quality, and the situation not advantageous for the sale of milk. He, however, produces from it a large quantity of beef, mutton, and pork, buying all his stock in young, and selling them out when fit for the butcher. As his land is not naturally rich, he spends a very large sum for oilcake and corn as extra food for his stock—a sum, in fact, exceeding his rent by at least 50 per cent. This liberal feeding is telling its tale upon the pasture lands, and if continued a few years longer will probably enable him to fatten his stock without so great an outlay for purchased foods.

The arable land is exceedingly clean and well managed, and the crops on it were most luxuriant, affording ample evidence of very high farming. Some of the pasture land has been drained, and the good results consequent thereon should induce the proprietor of the estate to complete the drainage of the farm. Some of the land had been very recently drained by the tenant, the landlord finding the tiles. This is, at the best, a makeshift mode of carrying out drainage works in the majority of cases, the work not being properly done.

Mr. Maskelyne employs 6 horses to do the work of his farm, and has also 2 nags, 1 cart-colt, and 2 yearling nag colts. In May he was grazing 32 two-year-old steers and heifers, 47 yearlings, 25 calves, and was keeping 6 dairy cows. Considerable judgment had been shown in the purchase of these, and they were a good, useful lot of animals, well done, and in thriving condition. He was also at the same time grazing 72 tegs, 22 two-year-old wethers, 50 ewes, 76 lambs, and 3 rams. His lambs are made into mutton very early in the spring of each year on roots on the arable land, being sold under one year old. When we were there in January last there were only about half-a-dozen left; these were very good, and were in fact sold to the butcher.

Store pigs are bought in every year to consume the offal of the farm, and are then fatted, adding considerably to the gross returns from the farm.

The accounts are well kept, and the balances properly shown. At the date of our third visit we found Mr. Maskelyne very busy securing his hay-crop, which was good and well managed. The lambs were weaned, and a capital lot they were, doing

well, and intended to be sold about or soon after Christmas as mutton. The crops of corn, with the exception of one field of spring wheat, were as good as they could well be; and the cabbages, after vetches, were looking well. We had some difficulty in putting this farm in competition with the dairy farms, but as the gross produce in the shape of animal food bears a favourable comparison with some of the best of the dairy farms, we all felt justified in recommending the Council of the Royal Agricultural Society to reward the great merit shown in the management of this farm, by giving Mr. Maskelyne an extra prize for the same, and we have very great pleasure in announcing that our recommendation was adopted.

Class 3.—Extra Prize Farm.

Chewton Farm, Stone Easton.—This farm, the property of the Countess Waldegrave, is situated about 7 miles north-east of Wells, in the county of Somerset, and is occupied by Mr. John Reynolds Keen.

It consists, according to the certificate of entry, of—

	A.	R.	P.	
	81	0	0	Arable land.
	166	0	0	Pasture land.
	78	0	0	Mountain pasture.
Total	325	0	0	

It is held on lease for 21 years, a moiety of which is unexpired.

There are no cottages on the farm. The house and farm-buildings are good, in excellent condition, and very well suited for the occupation.

The soil is described in the certificate as medium, and the subsoil as lias rock and shale.

This is a very nice compact farm, and the land is of good quality. The mountain land being a poor lot on the Mendip Hills, at a long distance from the homestead, is, however, excepted from this description. Mr. Keen gets his labour done very cheaply, viz., at about 20*s.* per acre, omitting the mountain land. He employs 5 labourers, at 13*s.* per week, with an allowance of cider during the summer months, and 20*s.* extra for their harvest; also 2 boys, one receiving 7*s.* 6*d.* and the other 5*s.* per week. Mr. Keen is the owner of a steam threshing-machine, which he lets on hire, and the two men whose duty it is to go with this are also employed on the farm when the machine is idle.

The live stock on the farm consists of—

Cattle.—41 dairy cows, 5 two-year-old steers, 2 bulls, 10 yearling heifers, 14 weaning-calves, and 7 grazing cows and heifers.

The dairy cows were a very good lot, selected with great care and judgment for the purpose for which they are required. There were some unusually good animals among them, some of which Mr. Keen exhibited at Bristol and at some of the local Shows. We cannot compliment him on his bulls, and trust he will see the necessity of using better males to such a good class of cows.

Sheep.—The sheep were a very good cross-bred flock, very well done, and in good condition. There were 177 ewes, 222 lambs, 21 barren ewes, 110 ewe tegs, 41 wether tegs, and 3 rams. The wether tegs were nearly ripe for the butcher.

Swine.—The swine consisted of 5 breeding-sows, 28 fatting pigs, and 36 stores. They were a good lot, and help to swell, in the shape of pork, the annual receipts in the balance sheet of the farm.

Horses.—The horses consisted of 4 cart-horses, 2 two-year-old colts, 2 nag colts, and a brood mare. The cart-horses are a very useful lot, suitable for the purposes for which they are required.

Warren's 'Farmer's Account-book' is used, the accounts are well kept and a balance sheet shown annually. A considerable return is made from this farm in the shape of beef, mutton, pork, and dairy produce. The farm as a whole is very well managed, and, with the exception of the 78 acres of off-lying mountain land, a general air of neatness pervades this occupation.

At the date of our third survey we found that Mr. Keen had secured a capital crop of hay, from about 72 acres of land, in excellent order, his stacks being models of neatness. The crops on the arable land were looking fairly well. He told us he only grows wheat when he wants the straw to thatch his ricks with. His course of cropping is usually roots, barley, seeds, oats. He occasionally leaves his seeds two years, and when he does so, this land is broken up immediately after the first hay crop is off to clear it for the next corn crop. The arable land, we consider was, on the whole, very well done, but not very highly farmed. The grass land on the home farm was in very good condition, and reflects great credit on the management. Since our May visit a pedigree Shorthorn bull had been purchased, which, although by no means a perfect animal, was a considerable improvement on his predecessors. We were pleased to recognise two of Mr. Keen's cows in the Showyard at

Bristol, and to find that they had been honoured by the Judges. If the 78 acres of mountain land had been, comparatively speaking, as well managed as the remainder of the farm, Mr. Keen might have had the Second Prize awarded to him; as it is, we felt much pleasure in asking the Council of the Royal Agricultural Society to give him an extra prize for the very large amount of merit shown by him in the general management of his farm with a view to profit, for the excellence of his cattle and sheep, and the great neatness of his roads, fences, and premises, and are pleased to record that our request was complied with.

Other Farms in Class 3.

Kambell Farm, Kingsweston, near Bristol, the property of P. W. S. Miles, Esq., and Mrs. Harford, and occupied by Mr. James Pearce, contains—

	A.	R.	P.	
	72	0	22	Arable land.
	300	3	22	Pasture land.
Total	373	0	4	

Mr. Pearce, in his certificate of entry, describes the largest portion of the farm as heavy, and the subsoil as chiefly clay.

The farm is situated about 5 miles from Bristol, and the land is of good quality. The house and buildings are of a useful ordinary type; on one homestead, formerly in the occupation of the proprietor, there is a very excellent and capacious cow-shed, and the other buildings there are of an equally good and substantial character.

The farm is held under a yearly tenancy; the terms of entry being feed-value for hay, straw, &c., and allowances for the unexhausted value of manures purchased, and of cake fed, during the last year.

About one-half of the farm has been occupied by Mr. Pearce for about 25 years, the other half for 10 years. For the last 7 or 8 years the produce of the cows has been sold in the shape of milk, but previous to that cheese was made. Two small fixed steam-engines of 4-horse power, one at each homestead, are used for chaff-cutting, corn-crushing, &c. Mr. Pearce cuts by machinery all the straw grown on his farm for bedding for his cattle, and also from 150 to 200 tons of hay for feeding purposes annually. In addition to this quantity of hay, Mr. Pearce also uses linseed-cake, maize, meal and bran to a rather considerable extent. The milk is delivered to Bristol twice a day, the

number of cows in-milk varying from 40 to 70. At the date of our visit in May, there were 67 in-milk. He also fats 40 or 50 head of cattle yearly, some on grass and some in stalls. There were 14 steers fatting in the stalls when we were there in January, of exceedingly good quality. At our second visit, 4 of these were on hand, good enough to win prizes at local Shows. From 20 to 30 calves are also raised yearly, chiefly heifers.

Mr. Pearce has 9 cottages, but these are rented separately. They have each nearly half an acre of good garden, and are let to his labourers at rents varying from 1*s.* 6*d.* to 2*s.* per week.

He employs 9 men constantly, at wages of 16*s.* per week, and 3 pints of cider daily, and employs extra labour during hay and corn harvest. The arable land is cultivated on a four-course system, viz., beans, wheat, clover, barley or wheat. This is well managed and in a good state of cultivation. The pasture land is low-lying, and naturally very wet, of good quality, and no doubt is very productive in moderately dry summers. On our visits in January and May we found this portion of the farm suffering much from excess of moisture; and the waste of the grass consequent thereon, and the injury done by the poaching of the cattle, were very great.

Cattle.—On the occasion of our first visit, the cattle consisted of 14 fatting steers, 50 cows in-milk, 34 cows in-calf, 2 bulls, 19 two-year-old heifers, 21 yearlings, and 7 weaning-calves; and at our second visit, 4 fat steers, 67 cows in-milk, 5 in-calf heifers, 29 fattening cows, 1 bull, 10 heifers, 23 yearlings, and 20 weaning-calves.

A very excellent lot they were, selected and bred with great care and judgment; their condition was excellent; wonderfully so, if their wet lodgings be taken into account. The bull used was a pedigree Shorthorn of good average quality.

Sheep.—The flock consisted of 68 breeding-ewes, 47 ewe tegs. The produce of the 68 ewes being 107 lambs. All these were in good condition, and of a useful cross-bred sort.

Swine.—About 10 pigs are usually kept, and these are bought in and fatted.

Horses.—There are 10 horses kept on the farm, 2 of which work the milk-carts. There are also 5 two-year-old cart-colts, 7 yearling colts, 4 nags of various ages, 4 four-year-old nags, and 1 two-year-old.

The farm horses are an exceedingly good lot. Mr. Pearce is evidently a "horsey" man; he has bred most of his horses, but purchased some, showing great judgment in both respects, making the breeding and selling of his horses a portion of his business. One four-year-old grey nag, a very sporting, hunting-

like looking animal, he announced his intention of exhibiting at the Royal Agricultural Society's Show.

Mr. Pearce is not great in the matter of accounts, but, looking at the way in which the farm is stocked and managed, we all feel sure that he has done something more than make both ends meet, and further, we feel sure that he deserves all he has gained.

Elm Tree Farm, Burnett, situated between Bristol and Bath, is the property of the Charity Trustees of Bristol and of the Rev. T. L. Sprye. It is occupied by Mr. Edward Paget, and consists, according to the certificate of entry, of—

	A.	R.	P.	
	81	0	0	Arable land.
	152	0	0	Pasture land.
Total	233	0	0	

Mr. Paget describes the nature of his soil as some light stone-brash, but principally heavy stone-brash, and the subsoil as white and brown lias stone and clay. The tenancy is a yearly one, subject to six months' notice to quit, with a Lady-day entry.

This farm has been in the occupation of the family for three generations. The house and buildings are good, and well suited to the occupation. The land is poor in quality, and the arable land—from the proximity of the rock to the surface and the large quantity of it mixed with the surface soil—is expensive and difficult to cultivate

The are 4 cottages on the farm, and Mr. Paget employs 6 labourers and a boy, also 2 women to milk the cows. He pays his 4 married labourers 13*s.* per week, with cottage rent-free, 20 perches of potato-land cultivated ready to receive the seed, and a daily allowance of cider. The two single men have 11*s.* 6*d.* per week, and an allowance of cider. The women get 3*s.* per week for assisting to milk the cows night and morning. No other expenses are incurred for labour on the farm; and the reason why so small a sum is expended, Mr. Paget states, is due to the fact that he can do any sort of work himself, consequently knows the exact amount of work a man ought to do, and, to use his own words, "By treating his labourers kindly, yet firmly, leads each to take an interest in his work—the carter in his horses, the shepherd in his sheep, and the cowman in his cows and pigs."

Cattle.—The cattle on the farm consisted of 35 dairy cows, 4 yearlings, 7 weaning-calves and a bull; these were a very

excellent lot. Mr. Paget has evidently a good eye for a well-made animal; and the white pure-bred Shorthorn bull which he had in use is a good animal, the best we saw during our visit to the different dairy farms.

Sheep.—A very good flock of cross-bred animals is kept, consisting of 109 ewes and 106 lambs, 52 ewe tegs, and 3 rams. At our visit in January there were also 56 fatting sheep, which had been disposed of before the date of our second visit. Mr. Paget prides himself on his management of his sheep, which are nearly always folded, both on the arable and pasture lands, summer and winter. The draft ewes and lambs are sold at fairs held in the neighbourhood in the months of August and October, and have generally realised high prices.

Swine.—The swine are of the Berkshire breed, very good animals, and consist of 6 breeding-sows and 46 stores. A considerable quantity of pork is fattened on the farm, this particular item showing a good profit. The work of the farm is performed by 5 horses, and a cart-colt is bred annually. There are 2 weaning-colts, and 1 nag is kept.

Mr. Paget mows annually for hay about 50 acres of pasture land, besides the seeds on the arable portion of the farm. Warren's 'Farmer's Account-book' is used, and the accounts are fairly kept. The farm is well managed and in a good state of cultivation, but we should like to have seen larger annual returns in the shape of animal food and dairy produce.

Moorend Farm, Slimbridge, Dursley, Gloucestershire, is situated about 3 miles west of that town. Lord Fitzhardinge is the owner, and it is occupied by Mr. Joseph Harding, under a yearly tenancy, with a Lady-day entry. According to the certificate of entry, it consists of—

	A.	R.	P.	
	35	3	2	Arable land.
	180	2	22	Pasture land.
Total	216	1	24	

The soil is described as principally heavy, and the subsoil as clay and a little gravel.

The house and buildings are very good, kept in good condition, and very neat. The labour on the farm is performed by 5 men, who receive 15*s.* per week each and cider; 2 women, at 6*s.* each per week, and there are 2 boys employed. The cost for labour being about 30*s.* per acre annually.

Mr. Harding keeps 4 cart-horses, 2 nags, and a pony; he has also 3 nag-colts, varying in ages from two to five years, and 1 two-year-old cart-colt.

The cattle in May consisted of 32 dairy cows in-milk, 6 ditto in-calf, 9 cows rearing calves, 9 two-year-old heifers, 10 yearling calves, 13 weaning-calves and 2 bulls. When we were there in January there were 14 fatting cows, which were sold before the date of our second visit. One of the bulls was a young one, lately purchased from the well-known herd of Colonel Kingscote, and is, we think, calculated to effect an improvement in this herd of good dairy cows.

The flock consisted of 75 breeding-ewes, 96 lambs and 3 rams —rather a mongrel lot as to breeding, but in very good condition, and very well cared for.

The swine consisted of 4 breeding-sows, 3 fatting hogs, and 46 store pigs.

Mr. Harding is great in cider making, his returns from this source being larger than what we found in any other case.

The land is of very good quality, and both arable and pasture land are well managed; there were some very fine growing crops on the former.

No manures are purchased, but a large sum is spent annually in feeding-stuffs for the stock.

At our first visit in January, we found the fences by no means in a good state. The dilapidations were, however, rectified at our second visit, Mr. Harding's custom being to do this annually, as soon as the hunting season is over.

Frocester Farm, about 5 miles from Stroud, in the county of Gloucester, the property of J. A. Graham Clarke, Esq., and occupied by Mr. George Savage, contains, according to the certificate of entry,—

	A.	R.	P.	
	62	0	0	Arable land.
	138	0	0	Pasture land.
Total	200	0	0	

In his certificate the soil is described as light, and the subsoil as gravel. The tenancy is a yearly one, with a Lady-day entry. The house and buildings are almost close to Frocester Station, which is a great advantage to this farm, stocked as it is with dairy-cows, the milk being sent thence to Birmingham and London daily.

The rate of wages in this part of Gloucestershire is low, viz., 13*s.* per week, and an allowance of cider during the summer months. The cottage-rents vary from 3*l.* to 4*l.* per annum. Mr. Savage's land being of good quality, he is not obliged to spend a large sum in purchased foods; his outlay in this respect, however, exceeds 20*s.* per acre.

The pasture and arable land are very well managed, and the gross returns from the farm are good.

The accounts are well kept, and on this farm we found a profit shown by the keeping of poultry, Mrs. Savage being evidently a good manager.

Some of the land where hay is grown is let to mow, make, and stack, by piece-work. This year the price agreed on was 10*s.*, and 6 quarts of cider per acre, making a total of 11*s.* 6*d.*

Four horses cultivate the land, and a nag is also kept. The dairy cows average 40. These are purchased at three-years-old in-calf, the calves being sold within a week after they are born, and the cows going at once into the dairy stock. About 9 of the best heifer-calves are weaned yearly, and we found 9 of these on the farm, and 9 a year older. The dairy cows do credit to Mr. Savage's judgment in selecting and feeding them.

Mr. Savage has a hobby in the shape of a water-wheel just erected for the purpose of cutting chaff, grinding corn, and other farm work. Like most amateur engineers, he has made a few mistakes, but is doing his best to rectify them.

West Leaze Farm, *near Swindon*, about 1½ mile west of Swindon, in the county of Wilts, the property of the Governors of the Charterhouse, and occupied by Mr. James Beaven, contains, according to the certificate of entry, 40 acres of arable and 186 acres of pasture-land; in all 226 acres.

Mr. Beaven has held the farm for twelve years, under a lease for that term, with a Lady-day entry. The soil is described as heavy and the subsoil as clay. There are 5 cottages on the farm, a good residence, and moderately good buildings. Five labourers are employed, at wages of 15*s.* per week, with their cottages rent-free. Very little money is expended on purchased food for the cattle, or artificial manure for the land. At the date of our first visit the milk from the cows was sold to the Aylesbury Dairy Company; but when we were there in May, Mr. Beaven had recommenced making the produce of his cows into cheese.

The *Live Stock* consisted of:—

Cattle.—At our visit in January, 49 dairy cows, 12 two-year-old steers and heifers, 23 yearling ditto, 4 working oxen, and a bull. At our visit in May, 43 dairy cows, 23 yearling steers and heifers, 4 working oxen, 16 weaning-calves, and a bull.

The *Sheep* were, in January, 150 Hampshire Down breeding-ewes; and in May, 64 breeding-ewes, and the same number of lambs.

Swine.—Thirty small pigs had been purchased to consume the dairy-refuse after cheese-making was resumed.

Three cart-horses and a nag are kept on the farm.

Woodcot Farm, Owlpen, Dursley, in the County of Gloucester, the property of Thomas Anthony Stoughton, Esq., is occupied by Mr. Henry Howell, and contains, according to his certificate, 77 acres of arable and 124 acres of pasture land; in all 211 acres. The tenancy is a yearly one, with a Lady-day entry. There are no cottages on the farm, and the labourers have to walk at least 1½ mile to get to their work. This farm is in a very elevated position, and the land is poor in quality, and very much out of condition. Mr. Howell, during the three years he has held the farm, has evidently done his best to put matters right, and must have spent a considerable sum for so small a farm in doing so.

In reference to the competition in Class 3, we were highly pleased to find so large and so good an entry, and hardly know how to express our admiration of the continuous and hard-working energy shown by these farmers and their wives, or our gratification at the proofs of the same in the very large returns from dairy produce and animal food. The percentage of arable land on this class of farms is small, and as only about half of this is devoted to the growth of cereals, the produce of straw for litter for the cattle is very small. Notwithstanding this, and the large number of cattle and pigs kept, the sweetness and cleanliness of the cow-sheds, piggeries, and yards, and the condition of the animals, we found to be, in almost all cases, all that could be desired. Some arable farmers with their cattle up to their necks in straw, and this valuable article uncared for and wasted, might learn a useful lesson on this point, and, indeed, on many others, from these West of England dairy-farmers. As the majority of the farms in this class were worthy of prizes, we found some difficulty in selecting only two to receive them. The great merit shown by the competitors induced us to ask for extra prizes to be placed at our disposal, and we are glad to record that the Council of the Royal Agricultural Society on our recommendation gave two extra prizes in this class. Success in cheese and dairy farms appears to us to consist mainly in a good selection of cows with good milking qualities, either purchased young or bred on the farm; feeding them well, getting every drop of milk from them night and morning; this, and the sale of the produce, being the work of the master. The manufacturing of the milk into a product fit for market is the work of the mistress. These duties, simple in themselves, require skill and unremitting attention to be carried to a successful and profitable issue.

Agricultural implement-makers and mechanics have not helped dairy-farmers much—bass brooms and shovels, liquid-

manure pumps and carts, cheese-presses, vats, and heating apparatus, being the articles most in use. A good milking-machine, if such could be found, would be a valuable addition to the list.

It will be seen in the reports of the various farms that some of the occupiers, who, from their proximity to a railway-station or a large town have special advantages, have availed themselves of these by selling the produce of the cows in the shape of milk; and the good policy of this is apparent, because if they can sell the raw product well—and in the cases mentioned they do so—good profits are made, and the mistress is saved much labour and many hours of anxiety. Another advantage which milk-selling has over cheesemaking is the quickness of the money return.

Class 4.—First Prize.

Kellaways Farm, near Chippenham, in the County of Wilts, the property of William Stancomb, Esq., and occupied by Mr. John William Long, contains, according to certificate of entry, 26 acres of arable, and 100 acres of pasture land; in all 126 acres.

The soil is described as medium, and the subsoil as gravel.

The farm is well situated, about 3 miles from the market-town of Chippenham; the land is of very good quality, held under a yearly tenancy, with a Lady-day entry.

The house and buildings are good, and suitable for the occupation. There are 2 cottages on the farm. Mr. Long employs 3 labourers, at wages of 15*s.* per week, and 3 pints of cider per day. One has his cottage rent-free, another one pays a nominal rent. The payments for the labour on the farm average about 20*s.* per acre per annum, but Mr. Long evidently does a large amount of work himself. He is a good workman, as the trophies shown us in the shape of silver cups for ploughing and other farm-work amply testify.

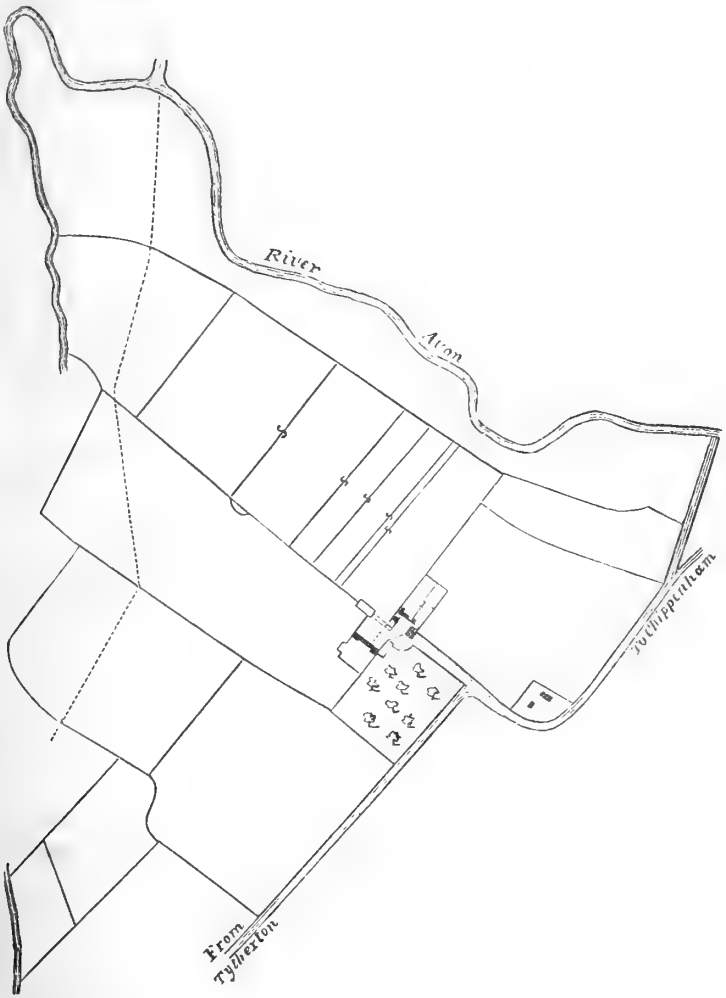
The beans and peas grown on the farm are mostly consumed thereon, and in addition thereto Mr. Long spends a considerable sum in purchasing extra food for his stock. He also purchases straw, and a large quantity of manure is brought on to the land from Chippenham.

The Cattle on the farm are 38 dairy cows and 1 bull. The cows are bought in annually and sold when barren, usually in the month of February, at about 25*l.* each, heifers taking their places immediately. The calves are sold young, the best as weaners. The cows are selected with great care for their milking qualities, and are a very good lot.

Sheep.—About 80 are usually bought or taken in to keep in

the autumn of each year, and are fed on clover, rape, and roots, having in addition about 1 lb. of oilcake or corn each per day.

Fig. 6.—*Kellaways Farm, Chippenham, Wilts.*



Swine.—Four breeding-sows are kept and their progeny are fattened, other pigs being purchased when required. Mr. Long sells his pigs when they weigh about 200lbs. each, and manages to get a large return from this source. The fatting styes are

well constructed, paved with bricks, with gratings to carry the liquid manure by pipes to a tank; no litter is used, and the styes are kept clean by sweeping and washing. The liquid manure from this source is a wonderful fertiliser, its effects on some of the growing crops we saw being very good; it is pumped by a chain-pump from the tank and conveyed by barrels to the land.

Two cart-horses and one nag are kept on the farm; they are very good useful working animals.

The arable land is cultivated like a garden, being wonderfully free from weeds, and the management of the grass land is very good.

Mr. Long informs us that he grows about 8½ acres of wheat after clover and roots, on which he folds sheep as much as possible before ploughing, and spreads the manure on the surface afterwards. Barley follows this crop, with a dressing of artificial manure in the spring. The beans grown are usually winter beans, and rape is sown with them the last time of hoeing. About four acres of roots are grown annually, drilled on the flat with liquid manure and Proctor's superphosphate.

A very large return is made from this small farm in the shape of dairy produce and pork. The buildings, hedges, ditches, &c., are all that we could desire in the way of neatness; the accounts are well kept, and the balance sheet properly shown.

This farm, in fact, has all the requisites of a prize farm, and we had therefore very great pleasure in awarding the First Prize in Class 4 to Mr. Long, who will, we feel certain, consider it a recognition of the untiring industry shown by himself and his wife in the management of this pretty little farm.

Class 4.—Second Prize.

Hill House Farm, Lipyeat, near Frome, in the County of Somerset, the property of F. P. M. Craddock, Esq., and occupied by Mr. James Hoddinott, contains, according to the certificate of entry, 11 acres of arable and 116 acres of pasture land, in all 127 acres.

The soil is described as light, and the subsoil as clay, light brash, and a little marl.

The Farm is situated about 7 miles from Frome; the land is of good quality, but the fields are rather scattered, entailing the necessity of driving the dairy cows rather a considerable distance to the homestead night and morning to be milked.

There are no cottages on the farm.

The residence is a very good one, and the farm-buildings are suitable for the occupation.

Mr. Hoddinott spends about 28*s.* per acre on labour, paying his ordinary men at the rate of 15*s.* per week, and 1 quart of cider per day, and he expends considerably more than the amount of his rent in purchasing food for his cows and pigs.

This dairy is wonderfully well managed, and we are informed that Mr. Hoddinott has won a considerable sum in prizes for his cheese during the time he has occupied the farm, and we had much pleasure in noting that the Judges of Cheese awarded him two prizes at the Bristol Meeting this year.

His returns in the shape of cheese, butter, and pork are large, the average per cow and per acre from these sources being exceedingly good.

The Live Stock on the farm consists of 42 cows, 6 two-year-old heifers, 8 yearling calves, and 2 bulls; there were 47 pigs in hand, and 2 cart-horses and 1 nag kept on the farm.

Mr. Hoddinott sells nearly all his calves young, at an average price of 30*s.* each, only keeping a few of the best to fill up the gaps in his dairy stock. The cows are a very nice well-bred lot, doing Mr. Hoddinott great credit. This year he has about 42 acres of his pasture land for hay, and a very good crop there is. He feeds about 53½ acres with his dairy cows, and the remainder with his young stock and horses: 4 acres of the arable land is in seeds; there also the crop is very good. About 7 acres are in fallow for swedes and turnips.

The whole management of this little farm reflects great credit on Mr. and Mrs. Hoddinott, and we were much pleased to award to him the Second Prize in Class 4.

Other Farms in Class 4.

Park Farm, Bower Ashton, Clifton, near Bristol, in the County of Somerset, the property of Sir P. H. Greville Smythe, Bart., contains 170 acres of pasture land, and is occupied by Mr. Stephen Harding.

The house and buildings are pleasantly situated near the mansion and park of the owner, and are very suitable to the occupation.

The Live Stock on the farm consists of 28 cows in-milk, 4 in-calf, 16 grazing cows, 10 grazing heifers, and a bull. The dairy cows are a very useful milking sort, having evidently been selected with great care and judgment.

The Sheep consist of 1 ram, 73 ewes, 105 lambs, and 78 tegs; these are very good cross-bred animals, and in very good condition. Two breeding-sows are kept and 2 brood mares; there are also 2 nags, 2 two-year-old cart-colts and one yearling.

Mr Harding expends about 33*s.* per acre for labour, paying

his men at the rate of 18*s.* per week, and cider during the hay harvest. A liberal sum is spent in food for stock on the farm.

Mr. Harding sells his calves young, at an average of about 30*s.* each, and sells his dairy produce in the shape of milk, which his proximity to Clifton enables him to do with great advantage. He has held the farm for six years, and his returns from his dairy during that time must have been great.

The land he occupies is of good fair quality, and his management is neat, good, and highly to be commended.

The Brook Farm, *Westbury-on-Severn*, *Gloucestershire*, the property of C. Cadle, Esq., and Mrs. Boughton, and occupied by John Cornelius Cadle, contains 46 acres of arable and 90 acres of pasture and orchard land, in all 136 acres. The trees in the orchards consist of pears and apples, the produce of which is made into perry and cider.

The tenancy is a yearly one, with a Michaelmas entry.

Mr. Cadle has two cottages, and employs 3 labourers; those occupying the two cottages receiving 12*s.* per week each, paying no rent, the other one receiving 15*s.* per week. He also employs extra labour in summer, and expends altogether in labour about 29*s.* per acre. Nearly all his sheep and cattle are bought in and resold fat. The amount spent for manure and for food for the stock is not large.

The Live Stock on the farm consists of 3 cart-horses, 2 colts, 6 dairy cows, and 4 three-year-old heifers, 6 two-year-old steers and heifers, 16 yearlings and 13 weaning-calves; 15 ewes and 21 lambs, and 16 cross-bred tegs; 2 breeding-sows, 9 fatting pigs, and 5 stores.

The whole of the live stock are evidently well cared for. The arable and pasture land and the orchards are fairly well managed.

Webb's 'Practical Farmer's Account-book' is kept.

The gates, fences, &c., are in good condition, and Mr. Cadle's management, with a view to profit, is certainly to be commended.

Ubley Farm, the property of the Rev. F. Arnold, and in the occupation of Robert Alfred Day, is close under the Mendip Hills, and about 11 miles from Bristol.

The farm is in five detached portions, some lying a considerable distance from the homestead and on the Mendip Hills; it consists of 25 acres of arable land and 155 of pasture, in all 180 acres. The land is wet and not of good quality. The house and buildings for a farm of this size, and occupied as this is, as a dairy farm, are simply wretched; the house is certainly not

fit for a respectable labourer to live in with decency. Labouring under such disadvantages, Mr. Day's management is much to be praised.

He keeps 45 dairy cows, 2 bulls, 7 yearling heifers, and 12 calves. His heifers calve at two years old, and his cast cows are sold in December.

Four horses are kept on the farm, and from 130 to 150 pigs are fattened yearly; these are sold when weighing from 160 lbs. to 200 lbs. each. Mr. Day purchases and consumes on his farm 9 or 10 tons of oilcake annually, and about 250 qrs. of corn. He also uses from ten to fifteen pounds' worth of lime yearly for manure.

Six men and boys work on the farm at wages varying from 12*s.* to 14*s.* per week; the men being allowed two quarts of cider and the boys one quart per day.

Mr. Day cuts from 60 to 70 acres of grass for hay every year, about 40 acres of which are top-dressed. About 6 acres of the farm are planted with fruit-trees, from which Mr. Day sells from 25 to 30 hogsheads of cider annually.

The five farms competing in Class 4 have many points of merit in common with the larger dairy farms, and the prize-takers in both classes have about equally good qualities. The management of the two to whom we have awarded the First Prizes goes very far to prove that land free from weeds, general neatness shown in the state of premises, roads, and fences, unusually large returns per acre from the land, and general management with a view to profit, are phrases representing facts very closely allied to each other.

These farms are models of good and profitable management, and as such are worthy of imitation.

The active intelligence shown by this and the preceding class of occupiers, and the absence of prejudice as to any particular mode of manufacturing their produce, seem to us the great secret of their success. These qualities have probably been acquired by mixing more with the mercantile world than ordinary corn-growing farmers usually do.

In concluding our Report, we think it well to note that, with a trifling exception, not one of the eighteen tenants whose farms we visited is in a position to avail himself of a single clause of the Agricultural Holdings Act. In further reference to the various farms we saw, we have much pleasure in remarking that the relations between the owners and the occupiers, and the latter and the labourers, seem to be uniformly good. The large number of dairy farmers in this district, who of necessity spend many working

hours with their servants, thus becoming well acquainted with each other's dispositions and requirements, may probably account for the retainment of the good feeling that once existed between the majority of the farmers in this country and their workpeople. Be this as it may, we note the fact that the servants we saw evidently take much greater interest in their work than is shown by the generality of farm labourers. We were also much pleased at the keenness shown by the majority of the competitors in placing before us all the points which they considered favourable in their respective cases, and some were really amusing in their anxiety, lest some special pet point of theirs should escape our observation.

This spirit of emulation we deem a desirable thing to encourage, and we are of opinion that, at all events as regards the dairy farms, the plan of giving prizes for the best-managed farms is productive of much good.

We were not favoured by the elements during any one of our visits; the first two were made in rain and snow, compelling the use of umbrellas and macintoshes, and the wading through mud and slush much more frequently than we found agreeable. We nevertheless enjoyed ourselves; and although we started very early every morning, and did not get back to our ever-changing hotels until late at night, being heartily tired at the end of each day, we retain most pleasing reminiscences of pleasant days spent in travelling together through many beautiful parts of some of our best English scenery, receiving everywhere from the farmers, their families, and all connected with them, the greatest possible courtesy, hospitality, and kindness.

We have also to thank the competitors for the frank way in which they answered our questions, and placed the documents we required at our disposal; and we hope we have obtained personally much useful knowledge from all we saw and heard during our surveys.

(Signed) Frederic Beard.
Thomas F. Jackson.
Thomas Willis, Junr.

II.—*Report on the System of Cheese-making practised on the Four Prize Dairy Farms.* By THOMAS F. JACKSON, of Tattenhall Hall, near Chester.

HAVING a large dairy myself, and having always taken a lively interest in cheese-making and dairy farming generally, I looked forward with very considerable pleasure to visiting the Somersetshire and Wiltshire dairies, and my expectations were more than realised. Aided by the moist climate of this part of England, the rich well-managed pastures are well suited for dairy purposes. The cows thus yield a large quantity of milk, which under skilful manipulation produces the rich fine-flavoured cheese for which this district is famous, and which commands a high price. In nearly all the farms entered for competition in Classes 3 and 4, the dairy produce was the principal means of the large returns; and with only one exception the dairy was managed by the farmer's wife, who, in cases where the accommodation was insufficient, having to work early and late:

> "Each morning finds her task begun,
> Each evening sees it close,
> Something attempted, something done,
> Has earned a night's repose."

It is not a part of our duty to say whether the same work under a skilful manager could not be more economically done in factories, where the best apparatus for saving labour would be made available. The prizes offered by the Royal Agricultural Society have certainly stimulated improvements in dairy machinery. The practical way in which dairy appliances were tried in the Bristol Showyard tested their merits, and intending purchasers will, by referring to the Report of the Trials, see which most suits their purpose. We think the farmers in Somersetshire have dairy appliances equal, if not superior, to those in any other county in England; but some of the landowners might very much facilitate cheese-making by erecting more suitable premises. There is in Somersetshire, as in the more northern cheese districts, the ever increasing difficulty of obtaining efficient female servants to assist in the dairy work, most girls preferring the higher wages and shorter hours of a town life. There is so much similarity in the method of cheese-making in Somersetshire, that by describing one dairy and the system pursued one very nearly describes all, the Cheddar system claiming to be the first and almost the only system of cheese-making reduced to rule. The dairy management of the First-Prize Farm (Class 3) is carried on with great care under the management of Mrs. Steeds, and a large

quantity of cheese per cow is made on this farm ; in a favourable season more than five hundredweight per cow average. Mr. Steeds labours under the disadvantage of insufficient accommodation both in the dairy and in the cattle-sheds. He has made an addition to his dairy this year at his own expense, from which he will derive considerable benefit. He has suffered much in some years from abortion in his cows, especially in the young ones ; it may perhaps be accounted for by the young cows not being so hardy as the older ones, and less able to stand exposure. Mr. Steeds is fully alive to the importance of having his cows regularly and well milked ; he consequently assists in this operation morning and evening. The milk is carried direct from the cows to the dairy, and placed in a large circular copper vessel, similar in construction to those used in all the Cheddar districts. It suits its purpose very well ; but I think the oblong one which was exhibited and took the First Prize at Bristol much more convenient and less expensive. There is a gauge fixed inside the tub for registering the quantity of milk contained, which enables the cheese-maker to add the rennet in a fixed proportion, a quarter of a pint of Hansen's patent rennet being used to every hundred gallons of milk. This is purchased from an agent in the neighbourhood at 10*s.* per gallon, and every one spoke in the highest terms of its merits. The morning's and evening's milk are mixed together, and before the rennet is added the temperature is raised to 80° Fahr. by heating the evening's milk with hot water run underneath the cavity in the bottom of the tub. An hour is the time most preferred for the milk to coagulate, and when coagulated, the curd is broken small by the aid of a scoop-breaker—which is made in a square frame and with brass bars across, about an inch apart, with a handle attached and hollowed in the middle—and the heat is then raised to 100° by the aid of a low-pressure boiler, put up at the tenant's expense. The curd is stirred intermittently for about twenty minutes, when the whey is drawn off and set for one day, and used for pig-feeding. The curd is broken finely in the whey, and ground very finely afterwards through the mill, and salted at the rate of 1 lb. of salt to 56 lbs. of curd. We had not much time to see the cheese-making process on this farm. Having a better opportunity at Mr. Gibbons's farm, I have given a more detailed description of the cheese-making process carried on there.

The Second-Prize Farm (Class 3) is in the occupation of Mr. Gibbons, and he has materially assisted to keep up the prestige of Cheddar cheese by going out of his immediate circle to exhibit, and with success. He has taken a prize in France, and has several times contested the honours in Cheshire, and once successfully, taking the Cup for the best cheese in the Show. The cheeses are

made by Mrs. Gibbons, who has been a cheese-maker from her earliest youth, being a daughter of Mr. Harding of Markesbury, a gentleman who most aided in extending the Cheddar system into Scotland, where some really fine cheese is now made. Mrs. Gibbons has good accommodation and the latest appliances; and these, combined with skill and careful management, enable her to produce an article worthy of exhibition anywhere. The accommodation on this farm is superior to any that came under our notice. The dairy is commodious and well ventilated; both milk and curd are very sensitive to impure air and soon become tainted; the curing- or cheese-room is over the dairy, and heated with hot air in winter, and the roof is whitewashed in summer; the heat by these means is pretty much under control. The milk is put overnight into a circular tin vessel, with a cavity underneath for running cold water wherewith to cool it. The water used for the dairy is pumped by the hydraulic ram noticed in the Report by Mr. Beard, and is conveniently laid on to the whole of the dairy, saving considerable labour in pumping and carrying water, a good supply of which is most essential. The vat, or the vessel in which the milk is put, is fixed on a wooden frame, with a contrivance for tilting to assist in running off the whey. It has also a gauge for registering the milk; the morning's and evening's milk are mixed together, and raised to a temperature of 80° Fahr., by heating a portion of the evening's milk in a boiler of hot water. About 5 drachms of Hansen's rennet is added to 11 gallons of milk, which coagulates it very regularly in an hour, much more so than when the vells were used, and the rennet made daily, by steeping a small portion of vell overnight in water for use in the morning; and Mrs. Gibbons thinks the milk yields a larger amount of curd with this rennet. When the milk is coagulated, the curd is cut diagonally with a large knife, and left until the whey begins to separate, when the scoop-breaker is used, gently moving it at first through the curd, great care being taken not to bruise the curd, so that it may not lose the fatty matter which it would do if broken roughly; the motion is gradually increased until the whole is very finely broken. Some of the whey is then drawn off and heated, and when near boiling is poured into the whole, which raises the temperature up to 90°, stirring at the same time to prevent the curd packing, and to heat it regularly. This, to use the local term, is the first scald; and after about 10 minutes the same is repeated, and the temperature raised to about 100° Fahr. Mrs. Gibbons prefers raising the heat at twice and heating the whey, to applying the heat underneath the tub; the whole is still kept stirred until the curd becomes more tenacious, offering quite a resistance when placed between

the teeth, no perceptible acidity taking place in the whey. After standing for some time, varying from half an hour to an hour, the time being ruled very much by the season of the year and the temperature of the atmosphere, the curd is collected in the centre of the tub by a circular action of the breaker, and the whey drawn off by a syphon and conveyed down an open tin spout, which is easily cleaned, into cisterns and left for one day, the top skimmed off and made into butter, and the refuse pumped direct into the piggeries. The curd is cut into squares of 6 or 8 inches, of an inch thick, and laid up to drain, being occasionally turned, and it is in this stage that the acidity is allowed to take place. There seems no means of testing the proper time to arrest the fermentation by adding the salt; it would greatly assist cheese-makers if some simple test could be applied, instead of it resting entirely with the experience of the cheese-maker's taste and smell. The curd is ground through a curd-mill before being salted, at the rate of 1 lb. of salt to 56 lbs. of curd, and, after being well mixed, is spread thinly over a lead cooler. It has to be turned several times, pure air being allowed to pass over it; when sufficiently cool, that is, at 60° to 65°, it is pressed under iron lever-presses to expel all the whey. The third day it is taken into the curing-room to ripen for market, a man putting on the bandages and turning it daily. Mr. Gibbons has a contrivance for turning a number of cheeses at once. There is a frame made of stout planks, with sufficient space for the cheese to go between, and a back hollowed to fit each cheese, to prevent its slipping through when turned over. The frame is fixed on two axles, and a windlass attached, which enables a man to turn 30 or 40 cheeses at once with comparative ease. The cheeses vary in weight from 40 lbs. to 112 lbs., and are covered with stout calico.

The dairy on the First-Prize Farm in Class 4 is managed by Mrs. Long, who strongly believes in the maxim that you cannot get any one to serve you as well as you can serve yourself. Although this farm is in Wiltshire, the cheese is made on the Gloucester system, both thick and thin cheese, or Single and Double Gloucester, being made. The manufacture is much the same in both, except that the thick cheese is made richer. The cows are brought up for milking into yards, and the milk is carried direct to the dairy. The evening's milk is placed in a tub into a cooler to facilitate its keeping sweet, a current of air through the dairy assisting to cool it. The cream is taken off the evening's milk during the early part of the year and made into butter, which meets with a ready sale in the Chippenham Market and surrounding neighbourhood, the price of butter varying from 1*s.* to 2*s.* a pound. Butter-making involves

a large amount of labour. I saw Mr. Long watching the trial of churns at the Bristol Show with very considerable interest. The use of the butter-working machine exhibited there would materially assist Mrs. Long. The price of Gloucester cheese will not compare favourably with that of the Cheddar, but Mrs. Long makes a large quantity of butter, and thinks it an equivalent. The milk is set together in the morning at 80°, and left an hour to coagulate, when it is broken and the heat raised to 100° by the aid of a small steam-boiler, which Mr. Long has had fixed under his own superintendence, with a good deal of mechanical skill, and which is well suited for the purpose. The surplus steam in cold weather is utilised for warming the cheese-room. The whey is heated to nearly 100°, the curd being constantly stirred while being heated, and the whey afterwards drawn off for butter-making and pig-feeding. The curd, after the whey is drawn off, is ground, and salted at the rate of 1 lb. of salt to 56 lbs. of curd, that is for the thick cheese; the thin cheese is salted under press by rubbing the salt over the outside every morning when the cheeses are turned. The whole of the dairy department is excellently managed, and is most creditable to Mrs. Long.

The dairy management on Hill House Farm, the Second-Prize Farm in Class 4, will compare very favourably with any in Somersetshire, and any practical cheese-maker having the privilege of seeing Mrs. Hoddinott's dairy management would derive pleasure and profit therefrom, and would find in Mrs. Hoddinott a lady who is not only courteous and communicative but eminently practical. Though not having the best accommodation, she produces the best results, as the many prizes her cheeses have gained fully testify. The dairy is detached from the house a considerable distance from the cow-sheds, and the curing-rooms are some distance from the dairy, all these disadvantages involving extra labour. The curing-rooms have been adapted from loose boxes to their present purpose. Some of the best cheeses we saw were made on this farm. The round tub is used, similar in construction to those already described, and having a gauge for registering the quantity of milk. The rennet is added in a fixed proportion; in fact, the whole process is carried on by strict rules. The liquid rennet is used, and is spoken highly of; the dried vells seem quite a thing of the past. The quantity of rennet used is next in importance to the quantity of salt, as too much renders the cheese tough and unpalatable, affecting the flavour; and too little causes considerable loss, by not separating all the caseine or cheese from the milk. The heat of the milk before the rennet is added varies slightly according to the season, being 82° in early spring and autumn, and 80° in

summer. When the milk has coagulated, the curd is broken, not very finely, with the ordinary breaker slowly and carefully, great pains being taken not to get the whey white. When sufficiently broken the heat of the whey is raised to 100° in spring, and in summer to about 98° Fahr. The whey is kept stirred for some time, and the curd not allowed to pack very rapidly. When the curd is collected the whey is drawn off and the curd lifted into a drainer and laid moderately thick, the heat being kept up. It remains entirely with the cheese-makers to say when it is ready for grinding and salting; this knowledge, at present, can only be obtained by experience. The curd is ground once, not very finely, and salted, at the rate of 1 lb. of salt to 56 lbs. of curd; when salted, it is laid out to cool and often turned over. Mrs. Hoddinott being very particular not to vat the curd too hot, it is sometimes 10 o'clock at night before it is vatted and put under press, and has to be watched and turned during this time. The cheese remains under press for three days, when it is moved into the curing-room, and bandaged and turned daily by a man.

In writing this Report, I have endeavoured to be as accurate as possible; but having had only a limited time in the dairy of each farm, I have depended pretty much on the information given by the cheese-makers. I must take this opportunity of thanking them for the frank way in which they described their method of cheese-making. In the neighbourhood in which I live, there is a certain amount of reticence amongst the makers of the best cheese in imparting information; but the cheese-makers in Somersetshire all seemed only too willing to impart or gain knowledge. In manufacturing milk into cheese a thorough change takes place, milk being so easily spoilt and so sensitive to atmospheric changes; consequently the Cheddar cheese-makers, although so much alike in their management, do not all produce the same results. I should recommend any one wishing to adopt the Cheddar system to endeavour to get permission to see the cheese-making process in this district, from its commencement to its finish.

(Signed) THOMAS F. JACKSON.
THOMAS WILLIS, Jun.
FREDERIC BEARD.

III.—*Report of the Senior Steward of Live Stock at Bristol.*

By J. SHUTTLEWORTH, of Hartsholme, Hall, Lincoln.

AT the termination of a four years' service, the Steward of Live Stock, having held the important position of Senior, is expected to write a short address as a preface to the more technical Report on the animals exhibited which is written by an official reporter—this year by Mr. Caird, son of the well-known agricultural statistician.

After an almost unbroken succession of Shows extending over a period of forty years, there is still sufficient variety in the Society's Country Meetings to justify the continuance of the old custom. The Bristol Meeting was certainly not wanting in this respect; and whether we consider the position of the Showyard, the state of the weather, the antique city, or the reception of the Society, much might be found by a ready writer to "point a moral and adorn a tale."

The Showyard, situated on Durdham Downs, an expanse of greensward on the top of the tall cliffs which border the winding river Avon, was an admirable Showyard when reached; and the means of getting there were alone sufficient to arrest the attention of any thoughtful visitor. Tramway and railway stations had both been brought, by circuitous routes it is true, very near the Showyard, although it was at an elevation of several hundred feet above the heart of the city, about two miles distant.

Bristol, although much modernised of late years, still retains many interesting marks of its medieval importance; and its citizens, although more famous for ploughing the sea than the land, gave a most hearty welcome to the tillers of the soil. The weather was everything that could be desired, sufficiently dry and not too hot, the perfection of comfort for man and beast.

The great feature of the Meeting was the visit of the Prince of Wales, the President Elect of the Society, on that occasion. Nine years had elapsed since His Royal Highness last visited an Exhibition of the Society, namely, when he was President at the Manchester Meeting in 1869. The citizens of Bristol thoroughly appreciated the honour thus conferred upon them, and were exuberant in the manifestations of their loyalty, which were limited only by the comparative shortness of time which His Royal Highness could devote to his visit to the city and the Show.

Although it is tolerably well known, it may not be amiss to repeat the often-told fact that the Prince of Wales takes an active interest in farming pursuits, and those who saw for the first time the critical way in which he examined his own sheep, as well as those which had either beaten them or been beaten by them,

must have thoroughly understood this at Bristol, if they never did before.

The traditional "men from Bristol city, who took a ship and went to sea," are represented in these days by a guild, called "The Society of Merchant Venturers." These gentlemen followed the example of the Mayor and of the Local Committee in entertaining the Council and Officers of the Society at a sumptuous banquet; and thus for three successive evenings were the labours of the day brought to a harmonious close.

It is said that every medal has its reverse, and unfortunately the Bristol Meeting affords another illustration of the truth of this dictum. Two accidents, one of which was fatal, occurred to grooms during the week. The first happened on the judging day to probably the most experienced Show-going servant in the whole Exhibition. If any stranger had asked who was the most knowing, the most handy, the most useful man in the Yard to attend and show-off animals for exhibition, every officer of the Society, and probably most other people whose opinion was reliable, would at once have said "Lord Ellesmere's Dan"; for as Dan, and nothing else, he was familiarly known, and yet that man was killed by a kick from one of his Lordship's fillies in the judging ring.

The other accident was the result of skylarking out of the ring by two young lads on ponies. They took the opportunity of retiring from the parade-ground to their stables to get up an impromptu race, much to the danger of the public. The result was that they cannoned against each other, and one of the lads paid the penalty of his disregard of instructions in the form of a broken leg.

The mention of these lamentable occurrences suggests the performance of a duty which is expected of the senior Steward, and that is, to give his colleagues on the Council the result of his observations and reflections on the rules and regulations which have been in force during his four years' term of office, with a view to their improvement in the future. It is not always desirable that the suggestions of the senior Steward should be published, at any rate until they have been considered in Council; but on this occasion I feel that the few remarks I have to make ought to be carefully digested by every exhibitor of live stock at the Shows of the Royal Agricultural Society.

The rules of the Society relating to the live-stock department of the Country Meetings appear to have been drawn up originally with the view that the exhibitors would co-operate with the Stewards in making the Show attractive to the public. Of late years, as the Exhibitions have grown in magnitude, the Stewards have found it increasingly difficult to induce exhi-

bitors, or rather their servants, to perform their part of the contract after the judging day; in other words, at the time of parade the servants in charge of animals are often absent, and, if present, they too frequently disregard the instructions given them. Thus, at Bristol, as many as twenty or more of the Society's yardmen might have been seen leading animals into the ring at one time, in the absence of the exhibitors' servants; and several of those servants who did attend, did not, after leaving the ring, return at once to their stables or their shedding, in accordance with their instructions. It seems to me clear that the Council will be compelled to make the exhibitors responsible for the actions of their servants in the Showyard. I once heard Lord Chesham, during a discussion at the Council on disqualification for unfair shearing, make this statement: "The first time I showed a sheep I was disqualified for unfair shearing. I said to my shepherd, 'The next time this happens, you go,' and I have never been disqualified since." This seems to me to point to the true solution of the difficulty.

It now only remains for me to take leave of my brother Stewards and the officers of the Society, and to express the hope that, arduous as the duties of Steward may be while they last, they will be accompanied to them by as many pleasant associations as I have met with during my four years' term of office.

IV.—*Report on the Exhibition of Live Stock at Bristol.* By James H. Caird, Esq., Northbrook, Micheldever, Hants.

An interesting, beautiful, and ancient city like Bristol, the centre of a large and varied agricultural district, was well chosen for the Royal Show of 1878. Cool and for the most part fine weather rendered the Showyard a pleasant resort, to say nothing of the magnificent display of live stock and implements. The visit of the Prince of Wales added another inducement; and the feeling of loyalty, always strong in the Western district, drew large crowds on Friday to the heights of Durdham Downs.

Of the arrangement of the Showyard I need not say more than that it was excellent; and I have to thank the Judges for their courtesy in giving me information when they were in the midst of their arduous duties.

The Show, I take it, was one of the best for general excellence that the Society has ever held; and, though the attendance in larger cities with more thickly populated country around has been greater, I think, considering all things, Bristol and its neighbourhood did its best to make the Meeting a success.

Horses.

In Class 1, for Agricultural Stallions foaled in the year 1876, the Earl of Ellesmere's "Young Prince of the Isle," a big, powerful bay horse, carried off the first prize. Mr. Frederic Street was second with "Grand Duke," an iron-grey, perhaps a little short in the ribs. The third prize was secured by the Earl of Ellesmere's "Young Drayman," a compact little horse. There were twenty-one entries in this class, but though the competition was a long one, nothing very nearly approached the winners.

The Agricultural Stallions foaled before Jan. 1, 1876, were an excellent class, and many of them were carefully examined before the decision of the Judges was made known. Mr. Stephen Davis was first with a grand five-year-old roan, "General." Mr. G. Herbert Morrell took second honours with "King of the Vale," a blue roan, with good trotting action. The third prize went to the Earl of Ellesmere, for "Pride of the Shires," and the reserve number to James Hibbard, Sen., for "The Sultan," a bright bay, with white face. "Young Champion," belonging to the Stand Stud Company, a noble old chestnut horse, frequently successful in former times, would probably have taken a place, but that he went slightly lame.

Class 3, for Clydesdale Stallions foaled in the year 1876, only produced four competitors. Mr. R. Loder's "Scotland Yet," a large-boned horse, was selected first. The Duke of Beaufort, K.G., was second with "Prince Charlie;" and "Waverley," the property of Mr. Vincent P. Calmady, was reserved and commended.

Mr. James Firth Crowther, in the Clydesdale Aged Stallion Class, repeated his triumph at Liverpool with "Topsman," a dark chestnut, with white feet; he is a strong compact horse, with splendid action. The Duke of Beaufort, K.G., was second with "Paragon Tom," a large heavy horse, almost too much so for a Clydesdale. The third prize was secured by "The Baronet," a three-year-old bay, for Messrs. E. and A. Stanford. Lord Fitzhardinge's "Prince of Clydesdale" (reserve) might have been placed higher had he been a better mover. It is worthy of remark that the first and second horses in this class were bred by Mr. George Wilson, of Aberdeenshire.

There were only two entries for Suffolk Stallions foaled in the year 1876. Mr. William Byford's "Reliance" took the prize. "Farmer's Glory," belonging to Mr. William Wilson, was the reserve number and highly commended.

The entry for Aged Suffolk Stallions was not much better than that in the previous class. Of five, only three put in an appearance. Mr. Horace Wolton's great chestnut horse, "Royalty,"

was first. Mr. George E. Elliot's "Iron Duke" was second, and Mr. William Byford's "Enterprise" was reserved and commended.

To continue the draught-horses I must pass on to Class 11, comprising Agricultural Mares other than Clydesdale or Suffolk. Here Mr. Lawrence Drew's "Countess" was unmistakably first. She is a brown mare, five years old, in foal to the celebrated "Prince of Wales;" well put together, and a good mover. Number two was "Dainty," belonging to the Earl of Ellesmere, a ten-year-old mare, in very high condition. Mr. W. Wynn's "Queen of Trumps" was third, and Mr. James Hibbard, Jun.'s "Diamond" was reserved and highly commended.

Mr. R. Loder headed the list for Clydesdale Mares with "Jean," in-foal to "Scotland Yet," the prize winner in the Two-year-old Clydesdale Stallion Class. Mr. Loder was also successful with "Dandy," she securing third place for him. Mr. Christopher W. Wilson's "Mrs. Muir" was second. Mr. Loder's "Jess," reserve number and highly commended; and Mr. Lawrence Drew's "Young Rosie" commended. Mr. Loder's three mares, and the second-prize animal also, were bred in the Stewartry of Kirkcudbright.

There were only four entries for Suffolk Mares, the breed not being strongly represented in this or in the Stallion Classes. The prize animal, however, "Belle of the Ball," belonging to the Duke of Hamilton, did credit to her county; her head, small and well set on, a powerful shoulder, and great girth being her salient features. "Duchess of Newbourn," Mr. Horace Wolton's mare, the second-prize taker, was also a good specimen. Mr. William Byford's "Doughty," a good goer, was reserved and commended.

After a very long conference, the Judges gave the first prize in the Agricultural Filly Class (including Clydesdale and Suffolk) to Mr. Lawrence Drew's brown filly, by "Topsman." The public were evidently against this decision, but the filly, though a little undersized at present, has splendid legs and feet, and looks as if she would grow into a great mare. The second prize went to Mr. Thomas H. Miller, for "Princess Dagmar," a very compact bay, with good shoulders. The Earl of Ellesmere's "Empress" was third. She is a light chestnut, a little long in the leg. Mr. William Byford's chestnut filly by "Hercules," a very strong-looking animal, was reserved and highly commended. It was during this long judgment that one of Lord Ellesmere's men was fatally kicked by his charge.

The next class, for Agricultural Fillies, three years old, was a small but good one. There were two absentees out of the eight entries. "Miss Linton" secured the first prize for

the Earl of Ellesmere. A fine large mare, "Countess," belonging to Mr. Joseph Hennessy, a local exhibitor, was placed second, and Mr. Lawrence Drew was third, with a brown filly. Mrs. Mary Pearce's "Diamond" was reserved and highly commended.

This class ends the exhibition of the Agricultural Horses, an exhibition that all farmers must take great interest in, as the horse is the most important animal used on the farm. No doubt of late years steam-cultivation has lessened the weight on his shoulders, but a good useful cart-horse is still essential to the agriculturist. On the whole, the display of draught-horses showed good quality. The Judges did not complete their labours till late in the afternoon, long after most of their colleagues in the other classes had finished, which was an evident proof that out of a generally superior lot, they had a hard task to decide on the winners. The following is their Report:—

Class 1.—*Agricultural Stallion foaled in the year* 1876, *not qualified to compete as Clydesdale or Suffolk.*—The first prize in this class was awarded to a fine powerful bay colt, owned by Lord Ellesmere, named "Young Prince of the Isles," he was bred by Mr. Fyson of Somersham, St. Ives, his sire being "Pride of the Isles." He is a grand colt, with a wide thick back and loins, very deep in his ribs, a fine round barrel, an excellent mover, with a good shaped head and firm legs with good feet.

The second-prize horse was a very useful iron-grey, owned by Mr. F. Street, Somersham (who has been instrumental in the formation of the English Cart-horse Association), with big legs and feet, he was hardly in so good a condition as he might have been, but at some future day will take a more prominent position in the Show ring.

The third-prize horse is a capital brown, with big limbs and full of hair, also owned by Lord Ellesmere; he is well formed and will make a good horse at more mature age.

The competition in this class was good, there having been no less than twenty-one entries.

Class 2. *Agricultural Stallion foaled before January* 1*st*, 1876, *not qualified to compete as Clydesdale or Suffolk.*—The first prize in this class was awarded to a big heavy red roan horse, owned by Mr. Davis, of Woolashill in the county of Worcester, bred by himself; he has tremendous muscle and big flat legs with extraordinary good feet, his back and loins are very thick, shoulders massive, though well-formed, with big fore-arms, and sound thighs, head large, masculine, but well shaped, action excellent for such a horse. He is every inch a cart-horse, and will be of great service to the county he represents.

The second horse is a weighty blue roan, four years old, owned by Mr. Morrell, named "King of the Vale," in many points equal to the first, and, had his feet been in better condition, we should scarcely have known to which to award the coveted red ribbon.

The third-prize horse is a good-framed bay, owned by Lord Ellesmere, with a good back, round barrel, limbs well set the outside of him; he had rubbed the hair from his fore-legs, which spoiled his appearance for the time being; he has taken several prizes, and will take more when in form.

This class was a very fine one, being represented by eighteen entries.

Class 11. *Agricultural Mare in Foal or with Foal at Foot, not qualified*

to compete as Clydesdale or Suffolk.—This was a very grand class, represented by sixteen entries; the first prize was deservedly won by Mr. Lawrence Drew with a bay mare named "Countess;" although shown by a Scotchman she was bred in England by Mr. Hawksworth, near Derby; she has splendid action, is very deep in her chest, with beautiful silky hair on her legs, head finely set on, and altogether is a very splendid mare.

The second-prize mare, again owned by Lord Ellesmere, was named "Dainty;" she has taken a great many prizes, and is a very massive, wide, powerful animal.

The third prize was awarded to a capital grey mare, owned by Mr. William Wynn, Stratford-on-Avon; she was raising a foal which did not give her a reasonable chance with the others; the Judges thought it would be better if mares in foal were shown separately from those having foals by their side.

Class 18. *Agricultural Filly including Clydesdale and Suffolk, Two Years old.*—The Judges differed very much in their opinion as to the merits of the various breeds shown in this class, as they represented the Clydesdale, Suffolk, and Shire horse; they hope the Council will seriously consider the propriety of showing the distinct breeds separately and to select three Judges in all Cart-horse Classes, one portion to judge Shire horses, another Clydesdale, the remainder Suffolk. This would avoid a vast amount of unpleasantness.

We very much regret that during the time this class was in the Ring one of Lord Ellesmere's men was killed by a kick from the third-prize mare.

Class 19. *Agricultural Filly including Clydesdale and Suffolk, Three Years old.*—This was a splendid lot indeed; Earl Ellesmere was once more to the front with a splendid mare, bred by Mr. J. Linton of Westwick Hall, Cambridge, that will one day prove a valuable investment to her owner, as she is sure to add lustre to the stud she represents. We thought this the best class in the yard.

The second-prize animal was owned by Mr. Joseph Hennessy, Clifton, Bristol, bred by himself; she is a capital filly, and will again be heard of amongst the winners.

The third prize was awarded to Mr. Drew for a brown mare, breeder unknown.

The reserve number in this class was given to Mrs. Pearce of Dyers Farm, near Bristol, for a very nice level mare, bred by the exhibitor.

The *Clydesdale* classes were as well represented in respect of both number and quality as could be expected at a Show held so far south. Several of the exhibits appeared to disadvantage from not being in Showyard-condition, but the animals submitted to inspection included some first-class specimens of the breed, among which may be particularised the aged stallion and mare which were placed first in their respective classes.

Class 3.—The first-prize horse, a bright bay, was not in Showyard-condition, but his large bone, excellent feet and pasterns, and good action, entitled him to the first place. The second prize was awarded to a brown horse of less substance than the first-prize one.

Class 4. The first-prize horse in this class was a massive dark chestnut, nine years old, of immense substance and splendid action, which far outstripped every one of his competitors. The second-prize horse was eleven years old, and had good hair, fair bone, and moderate action. The third prize was awarded to a fair horse three years old.

Class 12. The first animal in this class was a very grand mare, which was not in Showyard-condition, but her extraordinary bone, excellent feet and pasterns, and capital action fully entitled her to her place. The second-prize mare has a large frame, but she is too old-looking to appear to advantage in a Show-ring. The five-year-old mare, which was placed third, has true Clydes-

dale character, but she was rather deficient in substance. The commended mare has also in a high degree the leading characteristics of a true Clydesdale, but she was in low condition, owing probably to the fact that she was nursing a foal (a filly), which appeared an extremely promising youngster.

The Suffolk breed were on the whole poorly represented, in consequence of the Show being so far from its home.

Class 5.—The first prize in this class was awarded to a very good horse.

Class 6.—The first-prize animal is of the true Suffolk stamp, and the second-prize one is a very fair animal.

Class 13.—Suffolk mares were not well represented, those brought under inspection not being possessed of the true Suffolk character.

Andrew Montgomery.
Thomas Plowright, Jun.
Arthur William Crisp.

Report on Thoroughbred Horses, Hunters, Hackneys, and Ponies.

Class 7.—The action, quality, and character of the majority of the horses entered in this class were eminently satisfactory.

The winner of the first prize was, in the opinion of the majority of the Judges, a horse of a higher class than is commonly exhibited in a Showyard, and admirably adapted from his quality, power, and fine action, to produce weight-carrying hunters and hacks of the highest class.

The other winners and the reserve numbers, in this class, were also unusually good specimens of sires suitable for getting hunters; and, amongst the numbers of unmentioned stallions, there were many that came up to the ordinary standard of prize stallions.

Class 8 contained horses of exceptional merit. Nevertheless, the character of the class was very uneven. Many of the stallions entered were of a non-descript class, and it would be a difficult task to determine what class of animal many of them would be likely to get.

Class 9.—The winners, again, redeemed the quality and general character of this class, which, as a whole, was a weak one.

Class 10.—In this class the third prize was awarded to a yearling. This incident must assuredly be a sufficient proof of its weakness.

Class 14 was an unmistakably strong one. The winners of the prizes were mares of considerable merit, and the foals at their feet were especially promising.

Class 15.—All the mares exhibited, with the exception of the winner of the first prize, were of a very inferior class.

Class 16.—The animals in this class were wholly devoid of merit.

Class 17 was much better than the preceding one, the takers of the prizes being very fair representatives of their class.

Class 18, though weak in numbers, was satisfactory in point of merit, several of the animals shown giving promise of high future excellence.

Class 21 was very good and uniform, and was the strongest class at this Exhibition.

Class 22.—The entries were very numerous; and though, considered as a whole, this class was a good one with but few exceptions, the horses were not of sufficiently high class to meet the requirements of the hunting-field at the present day.

Class 23 contained several horses whose quality and character were of a high order.

Class 24.—Though some of the horses exhibited in this class were not equal to the weight set forth in the conditions, the majority were fair specimens of the weight-carrying hunter.

Class 25.—The entries were numerous; but the percentage of superior animals was smaller than it should have been.

Class 26.—A weak class, both in regard to quality and numbers.

Class 27 was fairly good and even throughout—the first-prize pony possessing exceptional merit.

Class 28.—Though containing no animal of more than average merit, this class was a fairly good one throughout.

Remarks on the Exhibition of Horses in general, &c., and Suggestions in regard to the Entry of Stallions.

There was no want of the useful or second-class animal manifested at this Exhibition; but, in the majority of the classes alluded to above, there was a great want of quality and action.

Formation does not appear so difficult to attain as quality and action; and until the general character of the horses exhibited shall be considerably raised in these particulars, the objects of the Society, in offering the liberal prizes they have annually done for the promotion of breeding high-class horses, cannot be said to have been attained.

The Judges have great pleasure in bearing testimony to the excellence of the arrangements in the Show-ring, as well as to the courtesy and efficiency of all the officials in attendance upon them.

It may be further desirable that some allusion should be made to a protest that the Judges are informed was entered with reference to the award of the first prize in Class 7, *on the ground of unsoundness.*

Whether the horse in question is sound or unsound, the Judges do not feel warranted in recording an opinion. Nevertheless, as the horse exhibited no symptoms of lameness during the usual trial in the Ring, to which he was subjected, they deemed it unnecessary to consult the Veterinary Inspector in attendance, in regard to the horse's soundness.

(*). The Judges, very reasonably, feel reluctant to offer any suggestions with reference to any matter of detail in connection with the regulations of the Society. Notwithstanding, they consider that the present instance warrants their making the suggestion that *all entries in the Stallion Classes* shall, for the future, be accompanied by a certificate, from a Member of the Royal College of Veterinary Surgeons, of soundness—given within one calendar month of the date of entry.

(*). Their reasons for suggesting this alteration in regard to the Stallion Classes only are that the trial to which a stallion can, under the most favourable circumstances, be subjected, is necessarily *very limited in extent;* and that it is *very possible* that any slight unsoundness might not be detected by them.

Digby Collins.
T. Pain.
Thomas Parrington.

Duncombe Park Estate Office,
Helmsley, near York,
12th September, 1878.

Dear Sir,

I have signed the Report, but I entirely disagree with the part I have marked thus (*).

I *know* from experience that horses have been sent for exhibition at the Agricultural Hall, with *certificates of soundness* from Members of the *Royal Veterinary College*, that were notoriously *unsound.*

With regard to "Preakness," the winner at Bristol, he has *coarse* bony

hocks; it would be no difficult matter to get ten members of the Royal Veterinary College to swear he was *sound*, and ten more to swear the *contrary*.

* * * * *

I am, dear Sir, yours very truly,

THOMAS PARRINGTON.

H. M. Jenkins, Esq.

SHORTHORNS.

The Judges of the Shorthorn cattle communicated to me their remarks on the noteworthy animals in their classes in the Showground, so I give them nearly verbatim. In Class 29, Bull above three years old, the Earl of Ellesmere's "Attractive Lord" was first; "a grand massive beast, with great style and majestic carriage, a wonderful barrel, and short legs; he is a little short of hair." Mr. William Linton's "Sir Arthur Ingram" took second place (he was first at Liverpool last year); "a grand old bull, has been exhibited very often; it would be wise in his owner to withdraw him from Showyards." "General Fusee," belonging to Mr. Thomas Hardwick Bland, took third place; fourth, Mr. Jabez Cruse, "Oxford Duke 10th;" reserve number and highly commended, Mr. W. Handley's "Royal Irwin;" Mr. A. H. Browne's "Pioneer," Mr. J. Vicker's "Duke of Howl John," and Mr. J. S. Bult's "Gallant Gay," were highly commended. "The whole class, excepting prize animals and those commended, was a middling one."

Bulls above two and not exceeding three years old were "a very modest class." "Kalamazoo," the property of Mr. W. Tennant, secured first place, and was second in the yearling class last year at Liverpool; he is a red and white bull, sired by "Sir Arthur Ingram," but "does not show sufficient masculine character." Mr. R. Stratton's "Pearl Diver" was second. Mr. John Elwell's "Bainesse Windsor," third. The Stand Stud Company's "Favourite" was fourth; the reserve and highly commended "Huntley" belonged to Mr. George Gibbons.

Mr. Thomas Willis, junior's, "Vice Admiral," a roan, with good outline, was first among the yearling bulls; he is rather short of hair, and "his horns show delicacy of constitution, and lack of masculine character." Colonel R. Loyd-Lindsay, V.C., M.P., was second, with a nice-looking roan bull, "Churchill." Colonel R. Nigel F. Kingscote, C.B., M.P., took third place with "Cowslip Boy." Fourth, the Duke of Northumberland's "Lord Mayor." Reserve number and highly commended, "Lord St. Vincent," belonging to Mr. W. Handley. This was "a middling class, some useful animals, nothing leading."

Among the Bull-calves, Mr. Samuel T. Tregaskis's "Master-

man" was put first by the Judges after a rather long competition. "There was some little criticism as to the award; many preferring Mr. Kennard's white Bull-calf; the prize animal was sold the first day to go to Australia." The second prize was given to the Rev. Robert Bruce Kennard's "Prince Victor," a charming-looking pure white little calf, much admired by the public. Third, Mr. A. Garfit's "Scothern Butterfly 2nd." Fourth prize, Mr. T. Wilson's "Oxonian." Reserve number and highly commended, Mr. R. Stratton's "Autumnus." "Beyond the prize and commended animals, there was nothing worthy of remark."

In Class 33, the first of the Cow Classes, for cows above three years old, Lord Fitzhardinge's "Rugia Niblett" came to the front; she is a red cow, "a little wanting in character, showing slight coarseness, rather an old style of Shorthorn." The second-prize animal was "Moonshine," belonging to Mr. Thomas Atkinson; this was an attractive cow, "with very nice top, neat, and full of character, but not so massive as the winner of the first honours." The third place was awarded to Messrs. William Hosken and Son's "Carnation 4th;" the fourth to Mr. T. H. Hutchinson's "Grateful." Reserve number and highly commended, Mr. Benjamin St. John Ackers' "Princess Georgie." Highly commended, Lord Fitzhardinge, for "Minstrel 4th." "Beyond the prize animals, this was a weak class."

The Class for Heifers in-milk or in-calf produced a fine lot of animals; according to the Judges "the best class they have seen." Mr. Richard Marsh's "Diana," a handsome roan, generally admired, with a very level back and good touch, was first. She seemed a very good example of what a Shorthorn heifer should be. "She was the best in the Heifer Class, had a beautiful barrel, and would have been female champion had there been such a prize; she keeps her place well from last year." Number two, "The Lady," belonging to the Earl of Ellesmere, was another fine specimen of a Shorthorn heifer. Mr. James Slee Bult's "Bertha 3rd" took third prize, and "Blooming Bridesmaid" secured the fourth for the Stand Stud Company. The reserve number and highly commended was Mr. George Ashby Ashby's "Innocence;" highly commended, Mr. Benjamin St. John Ackers' "Lady Carew 2nd." The commended heifer, "Red Rose of Virginia" "appeared to be hardly in Showyard trim."

In the Yearling Heifer Class "there were a good many absentees, and no leading animals." "Jemima 4th," the property of Mr. Albert Brassey, was "a massive heifer, but had not quite the style of the winner in the previous class; she is common coloured, but has good form." Colonel R. N. F. Kingscote, C.B., M.P., secured second place with "Honey 60th;" her

hind legs are not very good." The third and fourth prizes were awarded to the Duke of Northumberland's "Lady Jane," and Mrs. Sarah Jane Pery's "Lady Violet."

In the Heifer Calf Class "Lord Fitzhardinge came to the front with a splendid animal," "Kirklevington Empress 3rd;" she is a roan, light in colour behind, with beautiful hair and style; "she has a valuable pedigree, and was probably the best bred among the female classes." "Rose of Oxford 3rd," belonging to Messrs. W. Hosken and Son, was second; "she is a soft roan, and looked as if she would improve, but has one horn cropping up rather, and is a little steer-like about the head." "Melody," who came third, has the advantage of a good sire, "Attractive Lord," first at the Bath and West of England Show; she belongs to the Earl of Ellesmere. Fourth prize, Mr. A. Garfit's "Blanche Rosette 4th;" and reserve number and highly commended, the Earl of Suffolk and Berkshire's "Lady Agnes," a nice-looking heifer, with good colour and long silky coat. There were several other exhibits mentioned by the Judges, and they called the whole "a strong good class."

Class 37, cow, and not less than two of her offspring. The Judges thought this "a very interesting class and worthy of support, but there were several absentees, and some were short of numbers." Colonel R. Loyd-Lindsay, V.C., M.P., came first with "Burlesque," and her descendants, "a very even-looking lot; it appears from the entries that she never bred a bull." Mr. Joseph Stratton's "May Rose 2nd" included a very good-looking bull; and "Rosette," the first of her offspring, was exactly like her mother, and appeared to be a great milker. Mr. T. H. Miller's "family" came third.

Report of the Judges of Shorthorns at Bristol.

The Shorthorn entries numbered some 145; many, however, were absent, detracting very much from the appearance of the standings. The animals of such well-known breeders as the Marquis of Exeter, Lady Pigot, Mr. George Garne, and some others, were among the absentees. The competition in most of the classes was large, the cow class being the exception. There were some very prime specimens of this popular breed of cattle, but, as a whole, the show of Shorthorns cannot be said to come up to the usual Royal standard. We append particulars of each class:—

Class 29.—This was a large class; there was no difficulty in awarding its first, second, and third prizes. No. 360, to which the first prize was awarded, was an animal of considerable merit, and full of bloom; while the second prize, although a first-class animal, was suggestive of autumn leaves; his Showyard career is surely almost at an end; the same may be said of several others in this class.

Class 30.—This was a moderate class, nothing of a leading character. Many of the animals showed great unevenness; particularly noticeable in this respect were one or two white ones.

Class 31.—This was also a moderate class. No. 395, the first prize was

beautifully got up, he has a good outline but showed a little delicacy. The second- and third-prize animals were of excellent quality, the latter will doubtless improve in his fore-quarters as he grows older.

Class 32.—Although this was a large class and contained many useful animals, yet, beyond those to which the prizes were awarded, there was nothing to call for especial remark. The first-prize calf has better sprung ribs, more flesh, and is a truer made animal, than the second-prize, which, although shown in the finest trim, lacks the same depth of flesh; his tail too is not so well put on, something might also be said about his nose. We had no hesitation in making these awards.

Class 33.—This was a small and moderate class, by no means up to the mark for a Royal Show; the first-prize cow took by very far the lead.

Class 34.—There were eleven entries in this class, and to show our appreciation of it seven were noticed. The first- and second-prize animals were especially good, the former reminding us of the gems of the late Mr. Richard Booth in his palmiest days.

Class 35.—The entries in this class numbered twenty-three, six of which, however, were absent; eleven out of the remaining seventeen were noticed, a fact suggestive of our appreciation of the class.

Class 36.—There were also twenty-three entries in this class, eighteen of which appeared in the ring, ten receiving notice. The first prize was a gem; if fortune favours her she will adorn future Showyards. Many of the youngsters in this class promise well.

Class 37.—There was not that competition in this interesting class we could wish to have seen; we consider it one well worthy the encouragement of the Society. A family group will test the merits of a herd. The prize animals in this class were well worthy of their distinction.

In conclusion, we have the satisfaction of adding, that after due and careful attention to the merits of the various animals brought before us, all our decisions were unanimously arrived at. Our best thanks are due to the steward of our department for the business-like arrangements he made for placing the animals in the ring.

Charles Howard.
John Lynn.
George Mann.

Herefords.

There were only three entries for the Old Bull Class, and the owners of the prize-winners took the same position as last year at Liverpool, though Mr. Taylor won on this occasion with another animal. His bull, "Thoughtful," first in the three-year-old class last year, was a grand beast, with great depth and very good hind-quarters. Mr. Thomas Thomas's "Horace 2nd," the same that took second place at Liverpool, looked a more massive bull than his conqueror in this class. Messrs. J. Lewis and Edwin Powell were successful with "Telescope," who in his breeder's hands took second in the younger class at Liverpool; he has a great dewlap, but seemed not quite so good behind the shoulders as he might be. In the female classes the pair of heifers under three-years-old, belonging to Mrs. Sarah Edwards, were very much admired. "Leonora" was a splendid animal, in great condition, with short legs, enormous barrel, and level top;

she was specially led out for the inspection of the Prince of Wales. Mr. John Morris's yearling heifer "Empress" had great size for her age.

The Judges report as follows:—

Class 38.—Two shown. No. 496, first prize; a bull of good quality, with a lot of substance about him, and shown in good working condition. No. 497, second prize; a very fat bull, and not quite equal to his opponent as a breeding animal.

Class 39.—Three shown. No. 502, first prize; a bull of considerable merit and of nice quality. No. 501, second prize; a useful bull, but stood badly on his hind legs; would be more serviceable if not so fat. No. 499, third prize; defective in his hind-quarters, and had not quality enough to be classed as a first-rate animal.

Class 40.—Eight shown. No 508, first prize; a fine young bull, full of good points, and he will doubtless be seen again in the Showyard. No. 504, second prize; a very good young bull, rather too fat. No. 510, third prize; a young bull of nice character, with considerable substance, and in all probability he will appear in public again.

Class 41.—Six shown. No. 516, first prize; a nice young bull, but inclined to be "tubby;" should have plenty of exercise, and not too much succulent food.

Class 42.—Three shown. No. 522, first prize; a very fine old cow, full of good points and quality, but rather too fat for a breeding animal. No. 521, second prize; a very large fine cow, more *fleshy* than her rival, and likely to breed *weighing* animals.

Class 43.—Four shown. No. 528, first prize; a remarkably fine heifer, good all over, probably the best animal in the Hereford classes. No. 527, second prize; a beautiful heifer, but could only be placed second to such a rival. No. 531, third prize; rather too patchy.

Class 44.—Five shown. No. 541, first prize; a very nice young animal; will be seen again at future Meetings. No. 532, second prize; a good heifer, but not quite equal in character to her rival as a *breeding* animal.

Class 45.—Nine shown. No. 552, a very nice heifer, that will appear again as a show animal. No. 546, also a nice heifer that ran the first-prize one very hard, but had to give way in point of quality. No. 551, third prize; a smart heifer and well-grown for her age.

John Walker.
G. W. Baker.
John Crane.

Devons.

Not being far from the home of this breed, it might naturally have been imagined that there would be a good muster at Bristol; however, though the quality was good, and the prize-winners made a beautiful appearance on parade, the classes were by no means full. Viscount Falmouth's "Sirloin" was first in the old class; he has a great girth and level top, and was first last year among the younger bulls. Mr. Walter Farthing's "Royal Aston" showed beautiful quality in the class under three years. The bull-calves were a very excellent lot. Mr. Walter Farthing's exhibits were preeminent among the cow classes; he was first and second out of a very good lot of old cows. "Prettyface"

is lightish in colour, with a great barrel; she appeared to be heavy in-calf. "Picotee" has a sweet expression. The heifer-calves were a very even-looking and attractive class.

The following is the Report of the Judges of Devon and Sussex cattle:—

It being wished that we should write a Report of the Cattle we have judged, we beg to state that the Devons shown are very fine specimens of the breed; some of the first-prize animals are really wonders, and they certainly do very great credit to the breeders and exhibitors. We would, however, suggest that the breeders of Devons should not lose sight of size, so as not (if possible) to allow the animals to get smaller.

With reference to the Sussex beasts, we consider that they are much improved, especially the female animals; but we should much like to find in them a little more quality and greater mellowness of touch.

THOMAS POPE.
HENRY OVERMAN.
JOSIAH PITCHER.

SUSSEX.

There were some good animals of this breed, that so nearly resembles the Devon, but the entries were few in number. Messrs. E. and A. Stanford's old bull "Dorchester" had only another bull, belonging to the same owners, to compete with; he had great length and short legs, was light in colour, with a darkish face. Mr. James Brady's "Bouncer" is a great cow; and his yearling heifer "Rival," a dark-coloured one, showed well.

LONGHORNS.

It is a pity there were not more entries of this breed of cattle, which certainly have a grand and picturesque appearance, with great size. "Conqueror 3rd," belonging to the Duke of Buckingham, took first place, which makes the third time he has been in that coveted position at the Royal Shows; he is an enormous animal, with immense girth, and showed good quality. The second bull, "Prince Victor," did not fall much below the first in general features, some people in fact seemed to think he was the better of the two. A cow with the curious name of "Calke" took first prize in the class for cows, in-calf or in-milk, for Mr. R. Hall; her long even horns, bending down on either side of her face, nearly met over her nose.

The following is the Report of the Judges of Longhorns and Dairy Cattle:—

CLASS 63 contained only three entries, but they were all grand specimens of this old-fashioned breed, and possessed qualities which would do honour to any class of cattle.

There was some difference of opinion amongst the Judges as to the award

in this class, the majority of them preferring the old bull No. 645, considering him to have better quality of flesh and better sides than the fine active bull No. 646, which has a beautiful brindle colour, and won the second prize.

No. 644, reserve and highly commended, had good flesh and masculine character, but was not quite level in his back.

In Class 64 the two bulls exhibited were well worthy of the prizes.

Class 65 contained only one cow, a fine specimen of the breed, of the much coveted brindle colour.

Class 66 contained two fine heifers, the first prize, No. 652, being bigger for her age than the other.

The number of Longhorns exhibited would have been larger but for the unfortunate circumstance that several of the best cattle of this breed were detained in quarantine on their return from Paris.

Dairy Cattle.

Class 74 contained five pairs of cows, all Shorthorns pure or crossed.

The pair of roan cows, No. 740, had good frame and quality, and large bags. They looked like good milkers, but one had a coarsely-formed udder.

The pair of cows, No. 746, would have been placed second, but one had not so good an udder.

Class 75 was not so good as might have been expected.

Class 76 contained two pairs of nice Shorthorn heifers and a pair of Jerseys. None of them were forward enough in calf to show fully their milking properties. The Judges consider that they should have in their Catalogues the date of the last calving of the dairy-cows, as this is an important aid in deciding upon their milking capabilities.

William T. Carrington.
John Denchfield.
R. H. Chapman.

The Dairy Cattle competing for the prizes offered by the Bristol Local Committee did not muster strongly, but there were some good-looking animals among them. The first prize for a pair of cows in-milk, over four years old, was secured by Mr. Richard Stratton, who showed a good matching pair of Shorthorn roan cows, with grand backs, and mild-looking heads, one of the cows had a badly-formed udder, but was apparently a large milker. Mr. J. R. Keen took second prize, and Mr. Frederick Harvey third, both with Shorthorns. For the cows under four years old, Sir Philip Miles, Bart., took first prize, and Mr. John Yalland second. This class did not altogether meet with the approbation of the Judges. There were three good entries of heifers in-calf under three years old, but it was difficult to judge of their milking properties from their appearance. Mr. R. Stratton was first with a nice pair of pedigree-looking heifers of the Shorthorn breed. Mr. John Yalland was second, also with a pair of attractive Shorthorn heifers; and Mr. John Cardus had the reserve number awarded for a pair of Jerseys.

Channel Islands.

The Judges of the Jersey and Guernsey breeds of cattle have made such a full report, that it is unnecessary for me to add anything to it.

Jersey and Guernsey.

The total number of entries was eighty-three, whilst the average of the preceding seven years was fifty-six.

In the Jersey Classes the entries were fifty-six; but, out of this number, sixteen animals failed to come before us in the Show-ring. If, in the absence of these sixteen entries—ten of them being Mr. George Simpson's, of Wray Park—the competition was less keen, yet there was evidence, on the whole, of progressive improvement in the breed, and some of the animals showed marked superiority in this respect.

An increasing interest is now shown, not only at the Royal, but also at the principal county Shows in England, in this particular breed of animals, possessing, as they do, not only beauty and docility, but the richest and best milk-producing capacities.

In the year 1876 the Judges, in reporting upon the classes, wrote as follows:—"No less than thirty-three heifers, in-milk or in-calf, under three years old, were entered; and when it is considered that these specimens, varying from sixteen months to two years and seven months of age, were competing against each other, it will be easy to understand that a certain degree of difficulty exists in determining how the prizes are to be awarded. In this case a young heifer, twelve months old, without development of udder, might be brought before the Judges by the side of a powerful three-year-old in full milk, which might have given birth to two calves, and have no good claim to the distinction of heifer. How then, in fairness to the merits of each cow, can they compete in the same class? For this reason, therefore, and in consideration of the position which this class has attained numerically, the Judges deem it their duty to point out for the consideration of the Council the advisability of dividing for the future the heretofore existing heifer class into two distinct classes—viz., heifers in-milk or in-calf above two years and not exceeding three years old, heifers above one year and not exceeding two years old." Again, in the Report last year (1877), the Judges concluded as follows:—"The Jersey animal is by no means a meat-making animal, but especially a milk-producing breed; it is of the highest importance that the milk properties shall be developed as early as possible, hence we take the liberty of recommending the introduction of three additional classes for young stock—viz., bull above six months and not exceeding twelve months old; heifer in-milk or in-calf, above one and not exceeding two years old; heifer in-calf, above six months and not exceeding twelve months old."

We feel it necessary to again call the attention of the Council to the recommendations given above, with which we cordially agree; and we desire to add that, on the present occasion, we were quite unable to satisfy ourselves as to the order of merit of the various heifers brought into the Ring, consisting as they did of heifers fourteen months old, without development of udder, and cows just under three years old, in full profit. Under these conditions we could scarcely be expected to satisfy either the exhibitors or the public.

Class 67. *Jersey Bulls above Two Years old.*—Ten animals were entered, but two were absent. This class was of average merit. No. 657, first prize, "Saint Brelade" (three years and two months), bred in the Island, and shown by Mr. Cecil Bernadino Dixon, was an animal of true character. No. 664, the second prize, "Gipsy Lad" (two years and four months), bred and exhibited by

Mr. Herbert Addington Rigg, was a lengthy bull of good quality and colour; and the like may be said of No. 663, third prize, "Grey King" (two years and one month), bred and exhibited by Mr. William Alexander. No. 658, reserve number (three years and four months), was bred by Mr. William J. Beadel, and shown by Mr. John Cardus.

Class 68. *Jersey Bulls above One and not exceeding Two Years old.*—Eight animals were entered, but two were absent. Though small in number, the quality of this class was good. No. 666, first prize, "Lord Montague" (one year and eight months), was bred by the exhibitor, the Earl of Egmont. No. 667, second prize, "Ranger" (one year and eight months), was bred by the exhibitor, Mr. Findlater Crang. No. 665, third prize, "Emperor" (one year and four months), was bred by the exhibitor, Lord Chesham. This animal showed a deal of quality; his horns, however, were plain and too straight; he was also at a disadvantage in respect to age, otherwise he might have obtained higher honours. No. 672, reserve number and highly commended, "Tommy" (one year and three months), was bred in the Island by the exhibitor, Mr. William Alexander. This animal possessed many fine points; he may be said to be very taking in general appearance, but on close inspection his crumpled horns showed that they had been too closely scraped; and he had, what is considered a fatal objection to many breeders, a white tongue.

Class 69. *Jersey Cows above Three Years old.*—Eighteen animals were entered, but five were absent. The animals comprised in this class were very good. No. 687, first prize, "Duchess" (five years and four months), bred by Mr. Robert Gosling and exhibited by Mr. Thomas Barker Miller, is of a silver-grey colour, beautiful in form, and, what is all-important in a dairy-cow, showed rich and capacious milking qualities. No. 674, second prize, "Haphazard" (four years and two months), bred by Mr. Walter Gilbey, exhibited by Lord Chesham, may be classed as a very good animal; and the same praise as to her extraordinary milking qualities may be bestowed upon her as upon "Duchess" (first prize). No. 675, third prize, "Laura" (four years and ten months), bred and exhibited by Lord Chesham. No. 682, reserve number and highly commended, "Beauty" (four years and eight months), bred and exhibited by Mr. William Hood Walrond. No. 684, highly commended, "Brunette" (three years and two months), bred and exhibited by Mr. Cecil Bernardino Dixon. No. 685, highly commended, "Grisette" (four years and one month), bred in the Island by Mr. C. Vibert, also exhibited by Mr. C. B. Dixon. No. 688, highly commended, "Darling" (four years and three weeks), bred by Mr. W. J. Beadel, exhibited by Mr. Herbert Addington Rigg. No. 689, highly commended, "Flat" (over three years), bred in the Island by Mr. John Birch, exhibited by Mr. H. A. Rigg.

The above five cows, which we highly commended, showed fineness of breeding and unusual richness in milk-producing points. No. 683, "Beauty" (four years and one month), bred and exhibited by Lord Poltimore, would possibly have taken honours had she been shown with less meat and fat upon her, the latter a fault which should be carefully avoided where milking qualities are required, more especially in the breed under notice.

Class 70. *Jersey Heifers not exceeding Three Years old.*—Twenty animals were entered, but eight were absent. Several good animals were to be found in this class, and the number exhibited was double that of last year at Liverpool, but did not compare with the previous year at Birmingham, when the entries numbered thirty-three.

No. 706, first prize, "Fancy" (one year and five months), bred and exhibited by Mr. James Odams. This heifer (silver-grey in colour) was far advanced in calf, and had appearances pointing to the development of a great yield, rich in quality; in the Ring she certainly showed herself to be as near perfection, in all the necessary points, as could be expected.

No. 692, second prize, "Laurel" (one year and two months), bred and exhibited by Lord Chesham, silver-grey in colour; this heifer may be said to be well-bred and promising. No. 707, third prize, "Beauty" (one year and ten months), bred and exhibited by Mr. Thomas Barker Miller, a rather dark fawn; this heifer also apppeared to be well-bred and promising; being close to her time for calving, a good report can be recorded of her udder, which gave great promise, and she will doubtless prove an excellent milker.

No. 693, reserve number and highly commended, "Pattii" (one year and six months), bred and exhibited by Lord Chesham; an animal with good looks and quality.

No. 699, highly commended "Hawthorn" (one year and seven months), bred and exhibited by Lord Poltimore. This heifer had the misfortune to come before us in too meaty and fat a condition, otherwise she would most likely have taken higher honours.

No. 703, highly commended, "Queen of the Vale" (two years and seven months), bred and exhibited by Mr. George Digby Wingfield Digby.

In the Guernsey Classes the entries were twenty-seven, as against one animal only which put in an appearance at Liverpool last year.

The animals selected for honours in the following classes showed themselves to possess a type and qualification peculiar to this breed; they are in size much larger than the Jerseys, and carry more meat on their frames. In the catalogue the animals are described as red and white, yellow and white, and fawn and white; to more correctly define the colour we should call them red and white, and red.

Class 71. *Guernsey Bulls above One Year old.*—Five were entered, and all came into the Ring; only two prizes were offered, but after the first, second, and reserve numbers were selected, we found the two remaining animals so good that we considered them worthy of being highly commended.

No. 714, first prize, "Prince Charlie" (two years and five months), bred and exhibited by Mr. Robert N. G. Barker.

No. 712, second prize "The Count" (one year and six months), bred and exhibited by Mr. William Hood Walrond.

No. 716, reserve number, highly commended, "Chieftain" (one year and ten months), bred in the Island by the exhibitor, Mr. James James. No. 713, highly commended, "Duke" (one year and six months), bred and exhibited by Mr. William Hood Walrond. No. 715, highly commended, "Cloth of Gold 6th" (four years), bred on the Island by Mr. de Putron, and exhibited by the Rev. Joshua Rundle Watson.

Class 72. *Guernsey Cows above Three Years old.*—Twelve were entered, and eleven came into the Ring.

No. 719, first prize, "Young Nancy" (three years and nine months), bred and exhibited by Mr. Robert N. G. Barker.

No. 724, second prize "Miranda" (four years and seven months), bred and exhibited by the Rev. J. R. Watson.

No. 721, reserve number and highly commended, "Sylvia No. 2" (four years), bred and exhibited by the Rev. J. R. Watson.

No. 725, highly commended, "Juno" (three years and three months), bred in the Island by Mr. Davy, and exhibited by the Rev. J. R. Watson. No. 717, commended; this cow, unnamed in the Catalogue, was bred in the Island by Mr. Orgier, and exhibited by Mr. Herbert S. Woodstock.

No. 737, commended, "Gipsy" (four years and eleven months), bred in the Island by Mr. James James, and exhibited by him.

Class 73. *Guernsey Heifers in-Milk or in-Calf, not exceeding Three Years old.*—Ten animals were entered, but only six came into the Ring.

No. 730, first prize, "Dolly" (two years), bred and exhibited by Mr. Robert N. G. Barker.

No. 731, second prize, "Lady Jane" (two years and six months), also bred and exhibited by Mr. Robert N. G. Barker.

No. 732, reserve number and highly commended, "Crocus" (two years and ten months), also bred and exhibited by Mr. Robert N. G. Barker.

No. 734, commended, "Nelly" (two years and ten months), bred in the Island by Mr. Waldron, and exhibited by the Rev. J. R. Watson.

Before concluding this Report, we think it desirable to mention that a meeting of the breeders of Jersey cattle was held in the Showyard during the Exhibition at Bristol, for the purpose of establishing a "Herd Book for Jersey Cattle bred in England." The meeting was well attended, and, after a fair discussion, it was resolved to ask breeders to record the breeding and pedigrees of their animals, and a sum of 200*l.* was at once subscribed for the purpose of printing and publishing these particulars, as a first volume of a 'Herd Book.'

This meeting, as well as the increased entries at the Show (which were nearly fifty per cent. above the average of the last seven years), clearly indicated the increased number of animals that are being bred, and the interest that is being taken in them, especially for dairy purposes. This is the more noticeable in the neighbourhood of large cities; and we are firmly of opinion that when the Society's Show is held near the large southern cities, the classes for this breed should be increased, and a larger amount of money in prizes offered.

WALTER GILBEY.
C. STEPHENSON.

WELSH BLACK.

This picturesque-looking breed took a very prominent position in the Yard, and there were some animals of great merit among them. Mr. Charles Salusbury Mainwaring took the first prize for bulls over two years, with "Taihirion," an immense bull, very powerful about the neck and shoulders, and good all over. Earl Cawdor's "Prince of Wales" was second; he was first last year at Liverpool. The third-prize animal, Mr. David Davies' "Young Robin Dhu" may take a higher position on some future occasion, as he was very little more than two years old at the time of the Show. The class for young bulls was not quite so good as the preceding one. Mr William James's "Nigger Boy," the first prize, is a fine specimen, rather small, with straight horns, and curly hair on the head and neck. The old cow class was very much admired by the Judges and by the public. Mr. J. C. Best's "Welsh Duchess," a handsome old cow, with great depth, and a little white about the udder, was placed first after a close competition. Mr. J. Walters' "Favourite" was second, and Mr. J. C. Best's "Black Queen" third. This was such an even class that it was difficult to distinguish the prize animals. Mr. Walter Jenkins's "Nell" came to the front very decidedly among the heifers in-calf or in-milk under three years old. Earl Cawdor's "Kitty 6th" took second place. Heifers under two years old: this was a good class; Earl Cawdor's "Leonora," the first-prize animal, was very handsome, with a glossy coat and delicate touch; she has a streak of white

along the belly. Mr. R. Humphrey's "Black Queen 2nd" was second, and Mrs. Lettice Williams' "Myfanw" third.

The Judges report as follows:—

We are pleased to note a marked improvement in these classes since last year's Show.

Class 77.—The eight bulls shown (one entry being absent) over two years old were a good lot. Last year's winner, having grown coarse at the shoulder, was beaten by "Taihirion," a thorough Welshman, with no bad point. The third-prize bull, just over two years old, is very promising.

Class 78. The bulls under two years old were hardly so good a class. Of ten entries the five named were decidedly the best, without any particular merit calling for remark beyond the excellence of the first-prize bull.

Class 79. Cows were a magnificent lot, the nine entered being all good specimens. We had great difficulty in awarding the honours.

Class 80. *Heifers between Two and Three Years old.*—The first-prize taker is a heifer of extraordinary merit; nothing better was shown. The class being uneven, the prizes were easily placed.

Class 81. *Heifers under Two Years old.*—Some of these had grown to such a size that we doubted the ages given, which, however, were verified by the Inspector, proving what early generous treatment will achieve. All the prize-takers in this class have great merit.

Notwithstanding the creditable exhibits of Welsh Blacks both at Liverpool and Bristol, we do not consider a fair criterion can thereby be formed of the value of the breed to Wales generally, or of the estimation in which it is held by Midland Counties graziers and West End butchers. Prizes offered by the Royal Agricultural Society will do much towards developing this useful breed, a 'Herd Book' of which has lately been established.

John Williams.
John Evans.

Sheep.

The show of sheep was on the whole a very good one, and all the important English breeds were well represented. The Devon Long-woolled, the Dartmoor, and the Exmoor sheep must have appeared as novelties to many visitors to the Exhibition, as they are seldom seen away from their particular districts.

Leicesters.

Mr. T. H. Hutchinson showed the first-prize shearling ram, an animal with good wool and large frame. Mr. Hutchinson was first also in the aged class, with a ram of great size and rare quality, in high condition. Mr. Hebden Borton was second in the same class with a fine old ram, very level, with good fore-quarters. Mr. George Turner, Jun., was first and second, for the pen of five shearling ewes, with two good even-looking well-bred lots of sheep. Mr. William Brown's third-prize pen was rather open in the wool.

The Leicesters exhibited at Bristol were, taken as a whole, of only moderate quality; but the prize sheep in each class were exceptions to this remark,

as we have seldom seen so good a one as the two-shear belonging to Mr. Hutchinson. The race between the first- and second-prize shearlings was well contested, being only won by a "neck." Mr. Turner's first- and second-prize shearling ewes showed great character and good breeding.

Mr. Brown's had good fleeces and fat backs, but did not show quite such good breeding as Mr. Turner's.

JOHN S. JORDAN.
WILLIAM SANDAY.

COTSWOLDS.

A champion prize, offered by the Gloucestershire Agricultural Society for the best ram of this breed, was awarded to Mr. Russell Swanwick for the six-tooth ram No. 871, the first in its class. This was a great ram, with level back and full frame. Mr. Swanwick also took third prize in this class, Mr. Thomas Brown being second. In the shearling ram class there were a good many entries. No. 845, Mr. John Gillett's first-prize ram, was a fine-looking animal, with massive fore-quarters and good back. Mr. Russell Swanwick was second and third for two sheep in great condition. Mr. John Gillett was first and third for the shearling ewes, and Messrs. T. and S. G. Gillett second; these pens did not appear to be quite so even as they might have been, but the wool seemed to be of fine quality.

The twenty-six shearling rams in Class 85 made a good entry as to numbers, but were not quite up to the usual standard with regard to quality.

In Class 86 there were eight entries, three of which were absent. No. 871 was a very good specimen of a Cotswold ram, being of good quality, though rather deficient in wool.

The six entries in Class 87 call for no special remark.

W. T. GARNE.
THOMAS PORTER.

LINCOLNS.

Mr. H. Smith was first in the Shearling Ram Class with a very compact sheep. Mr. A. Garfit took second place. In the Aged Rams, Mr. H. Smith was again successful, showing "Hermit," the winner at Liverpool, in the same class. This sheep is a little deficient in wool, but has a great carcass and a fine straight back. The Lincolns, as a whole, looked very well, but the Judges made some remarks to me about shearing, and I see they have embodied them in their Report.

The number of pens shown in this section was good in the Shearling, but limited to four pens in the Aged Ram, and four in the Shearling Ewe classes.

Mr. H. Smith maintained the high position he has lately taken, as he carried off the first prize in both the ram classes. His aged sheep, bred by Mr. Tom Casswell, of Pointon, is a remarkably fine specimen of a Lincoln; but we do not consider that, taken as a whole, the average of excellence of the sheep shown is equal to that of some former years. We think it worthy of remark by Lincolnshire sheep-breeders that, out of the nine prizes given by

the Society to Lincoln sheep, five were awarded to gentlemen residing outside the county of Lincoln.

We take this opportunity of expressing a doubt as to the wisdom of the course taken in abolishing the office of Inspector of Shearing. It is a sufficiently ungrateful task for Judges to select prize animals from amongst the flocks of their friends and neighbours, without devolving upon them the onus of making a charge of dishonesty against any of them, which a disqualification for unfair shearing evidently implies. We fear that under the present system, in most cases where unfair shearing is found, Judges will not have the courage of their convictions, and the offender will escape the punishment he merits.

CHARLES WILLIAMS.
WILLIAM COLLINGWOOD.

OXFORDSHIRE DOWNS.

This very useful breed of farmers' sheep did itself full justice at Bristol. There was a large entry of shearing rams, and though but a small one of aged rams, it was composed of sheep of very fine quality Mr. Charles Howard's first-prize shearling ram had a perfect shape and beautiful head; he looked like good mutton, and was very close in the wool. Mr. Charles Hobbs's ram took second place; a well-bred sheep, with the wool quite on to his head. The old rams were all splendid specimens. Mr. John Treadwell was first and second, Mr. F. Street third, and Mr. C. Hobbs highly commended. Mr. Treadwell's first, "Royal Liverpool," was a great and very well-made sheep, with immense girth, and the second was little inferior. Mr. Frederic Street's sheep, as the Judges say, was worthy of a third prize. Mr. Albert Brassey's pen (No. 947) was the winner in the Shearling Ewe Class; they were very uniform in character, with dark faces and good size. Mr. Treadwell's were also a good pen.

The Judges have reported as follows:—

CLASS 91, for Shearling Oxford Down Rams, was well represented as to numbers, there being an entry of twenty-three. The first-prize sheep, No. 918, was a very true-formed sheep of good size and quality, and covered with good flesh, and of good character. No. 915, the second-prize sheep, was also of good character and formation, and promises to be a good sheep another year.

CLASS 92, for Rams of any age. There were only four entries, all good; indeed, so good that we strongly recommended the three prizes to be given. This was a superior class of grand character, and did the most to uphold the character of this superior breed of sheep.

CLASS 93, for Shearling Ewes. There were six entries, of good general character. The first- and second-prize pens were very large heavy sheep. The first-prize pen were the most matching lot.

R. J. NEWTON.
G. HITCHMAN.

Southdowns.

Lord Walsingham was a large exhibitor, and the chief prize-taker, in the well-represented classes of this breed: he took first and second place in the shearlings with a couple of nice level rams. Mr. Hugh Gorringe was third, with a good-looking animal, light in the face. Several exhibitors were commended and highly commended; and even after that there were some excellent rams left, of which no notice could be taken. In the Old Ram Class, Lord Walsingham carried all before him, the three prizes falling to him for a beautiful trio, the first one apparently perfect, showing true colour, close wool, and choice mutton. Lord Walsingham was first in the Shearling Ewes, with a pen of splendid character and perfect match. Sir Nicholas William Throckmorton, Bart., was second; and for third place the Prince of Wales was successful with a very nice pen of ewes, matching well, a little dark in the face. Taken altogether, the show of Southdowns was an excellent one.

The following is the Report of the Judges of Southdown, Hampshire Down and other Short-wool Sheep:—

The Classes of Southdown sheep mustered very strong. The Shearling Rams were a very good class, many of surpassing excellence. In the old class Lord Walsingham was invincible, showing three remarkably good specimens of the Southdowns, the second in the class being of great size, with quality combined. The shearling ewes produced a very close contest, the pens being remarkably even, and well matched, and the Judges had some difficulty in awarding the prizes, the whole class being commended.

The Hampshire Downs did not muster so strong, but some very good animals were shown, Mr. Morrison easily taking first prize with his wonderful shearling. The old ram class was fairly represented. The shearling ewes were exceedingly good. The first- and second-prize pens we considered first-class, doing very great credit to Mr. Read.

H. Fookes.
F. Budd.
F. M. Jonas.

Hampshire and other Short-wools.

These were chiefly Hampshire Downs, but the entry was not a heavy one. Among the Shearling Rams, Mr. A. Morrison was placed first, for a fine sheep of true type, with good girth and long delicate ears. Mr. H. Lambert came second, and Mr. J. Barton third with a large sheep. In the Old Ram Class, Mr. Morrison again succeeded, showing a massive animal. Mr. James Read had two beautiful pens of shearling ewes, good in the girth, with dark faces. Mr. Frank R. Moore had a very useful-looking pen of farmers' sheep.

Shropshires.

The very large muster of Shropshire sheep shows the high estimation in which this useful breed is held. The Judges

have reported so fully that it is unnecessary for me to add anything to their Report:—

The Class of Shearling Rams had sixty-one entries. A large proportion of these were uniformly good, while there were none which the Judges could at once fix upon as standing out far beyond their fellows.

The Aged Rams, eighteen in number, were, with few exceptions, very good. Captain Townson's is unmistakably at the head of this class, and does great credit to a young breeder of Shropshires.

The winners of the first prize for Shearling Ewes, Lord Chesham's, were exceedingly good; the second, Mr. C. Byrd's, were larger, but not so uniform; the third, Mr. Nock's, larger still, but still more varying in form, showing that in Shropshires, as in other breeds, it is more easy to combine perfection in form and quality with moderate than with extraordinary size; but size must be maintained. Some of the ewes in other pens were too small and light of bone, wanting the characteristics of this breed, which are a bold head well covered, a big neck, strong bony limbs, the indications of heavy lean flesh. These qualities, combined with oblique shoulders and a spine well covered, dark-brown features, and a close heavy fleece free from grey wool, are the attributes we have looked for in awarding the prizes offered for Shropshire sheep.

The services of the Inspectors of Shearing were dispensed with on this occasion, and we should have been glad to find that they were not necessary. In their absence the Judges were requested to notice those animals which had not been shorn bare after the 1st of April, one of the conditions of entry. There were a few suspicious cases; but one, No. 1081, admitted of no doubt. We hope, for the credit of our fellow breeders of Shropshire, that there will be no instance of this sort in future; it is quite certain that such attempted deception does not tend to success in the Showyard.

R. H. Masfen.
John Coxon.
C. Randell.

Devon Long-wools.

The muster was not strong here. Mr. Richard Corner's shearling ram was a good one, very level, a little small, but showing character. Sir J. H. Heathcoat-Amory, Bart., M.P., had a fine even pen of shearling ewes in high condition.

The following Report has been received from the Judges:—

The Devon Long-wools were a fair average lot. The competition in the Shearling Ram Class was good. In the aged class the competition was not strong in numbers, but of equal quality. There were only two pens of shearling ewes shown, each of which we thought well merited a prize.

Thomas Willis, Jun.
James Tremaine.

Somerset and Dorset Horned.

Mr. Herbert Farthing was the chief exhibitor and prize-taker among the rams, and Mr. John Mayo was the owner of the two pens of shearling ewes.

Dartmoors.

The chief characteristics of this rather uncommon breed are heavy-looking wool and white faces. Mr. John London Brem-

ridge's first and second shearling rams showed good size, with curly wool. Mr. Roger Palmer's old ram was rather deficient in girth, but had good close wool for the breed.

Exmoors.

These most picturesque-looking sheep are admirably adapted for adorning a gentleman's park. Lord Poltimore's two shearling rams, with their small size, curling horns, and white faces, had a charming appearance. Earl Fortescue had a fine old ram, with good wool, beautiful eye, and immense horns. The pens of shearling ewes were most attractive. Lord Poltimore's well-matched lot drew a great deal of attention, and seemed to be almost regarded as pets by the fair sex.

The Judges report on the three preceding breeds as follows :—

The general character of the entries of Somerset and Dorset Horns was very good, and we strongly recommended that a second prize should be awarded to No. 1166.

There is a great improvement in the breed of Dartmoors, especial attention evidently having been paid to their wool-bearing.

We cannot speak too highly of the whole of the classes of Exmoors.

William Poole.
William Benj. Hebditch.

Pigs.

The pigs on a farm are too apt to be left pretty much to themselves. They get on fairly well without great care being bestowed either on their feeding or breeding, so it is a good thing for the farmer to be able to see what can be done by enterprising people in the way of selection and management. Pork is almost the sole animal food of the labouring class; and even the very useful annual statistical reports are insufficient to show the numbers of swine that are every year converted into meat, as there are a certain number of pigs born, too young to be included in one report, that are probably eaten before the next one is made up.

Large White Breed.—Except for the breeding-sows, the entries were not very good. Messrs. James and F. Howard's young boar had good colour, fine hair, and great size for his age. Mr. R. E. Duckering's boar looked like one that would put on flesh well. In the Old Boar Class the Earl of Ellesmere was first with "Samson 2nd," an enormous animal. Messrs. J. and F. Howard's "Tiger 2nd" had long glossy hair and true colour. The Earl of Ellesmere showed a perfectly matching and well-bred pen of three young breeding-sow pigs of the same litter. The breeding-sows all were of good quality. Mr. R. E. Duck-

ering's prize animal was a mountain of flesh, with long fine coat, perfect colour, and immense back.

Small White Breed.—There were some very good specimens of this breed. The Earl of Ellesmere had a very promising young boar, and Mr. Sanders Spencer was successful in three classes, his boar "Omega" being of great excellence.

Small Black Breed.—The breeding-sows of this breed were all of very high quality. It must have been a difficult matter for the Judges to pick out the best animal. The Rev. William Hooper's "Gipsy Queen" was a splendid sow, with a great show of hams and bacon.

The *Berkshire* Boars generally were not very good; the sows, however, made a very fine exhibition, and were all commended by the Judges.

Among the pigs not eligible to compete in the preceding classes, there were some good animals. The Earl of Ellesmere's breeding-sow "Kate Vaughan" had great size, and some of the characteristics of the Small White breed as well.

Large White Breed.

Class 115. Four entries; with the exception of the first- and second-prize animals, they were of moderate quality.

Class 116. Five entries, and, like the other class, they were only of moderate merit after selecting the first- and second-prize animals.

Class 117. Five entries. This class was fairly well represented.

Class 118. Ten entries. This was a good class throughout, rather above the average, some of the animals combined good quality with great size.

Small White Breed.

Class 119. Nine entries. There was good competition in this class, several of the animals being of great merit.

Class 120. Eight entries. This was also a good class.

Class 121. Three entries, and only of moderate quality.

Class 122. Eight entries. There were several good animals exhibited in this class, but nothing special except the first- and second-prize animals, which were very good.

Small Black Breed.

Class 123. Nine entries. This class was well represented, several good specimens of the breed being amongst them.

Class 124. Four entries; all good animals.

Class 125. Four entries, of average merit.

Class 126. Eleven entries. This was a very superior class, four highly commended, and the remainder of the class were commended.

Berkshire Breed.

Class 127. Seventeen entries. This class was well filled but, with the exception of the prize animals and two highly commended, were only of moderate quality.

Class 128. Five entries. A very good class, all the animals either took prizes or received commendation.

Class 129. Ten entries. This class was fairly well represented, but nothing of any special merit.

Class 130. Twenty-nine entries. This class was the great feature of the

show of pigs; it contained probably the largest number, and the best animals ever exhibited in one class of pigs since the establishment of the Society; and notwithstanding their number, the Judges awarded two special commendations and nine high commendations, and the whole of the class was commended. As may be supposed, the three animals that took the prizes and the reserve number were of very high order of merit.

Other Breeds, not eligible to compete in the other Classes.

Class 131. Four entries. Small class, but of fair average quality.
Class 132. Four entries. Some very good animals in this class.
Class 133. Seven entries. This class was of very moderate quality.
Class 134. Nine entries. There were several very good specimens of the middle breed exhibited in this class, especially the prize animals, which were unusually good.

We are glad to be able to report that the disqualifications were much fewer than on some previous occasions; but several of the breeding-sows were so over-fed as greatly to imperil their future usefulness.

John Fisher.
Edward Little.
Matthew Walker.

The Judges report well and fully of the exhibitions of cheese and butter. The large number of entries proves that dairy farmers appreciate the verdicts of the Royal Agricultural Society, and there is no doubt that a general improvement in the manufacture of cheese and butter is necessary, to enable the British producer to hold his own against the large importations from abroad of both these articles.

Class 141. *Fresh Butter.*—In this department there were eighty entries—Nos. 111 to 191; nearly all were presented to the notice of the Judges.

There were no disqualifications; all arrived in good condition save one lot, which was injured in transit.

The general character of the fresh butter shows a manifest improvement as regards flavour, firmness, purity, and appearance.

Indeed, the general excellence of the article imposed on the Judges a difficult task:—to award the prizes when all the entries were good.

They minutely reviewed their decisions, and are satisfied they have done their best, and have given a larger number of commendations than is usually the practice. One deprecatory remark alone they feel it their duty to make, *i.e.*, some lots exhibited a higher colour than is natural, and led to the suspicion that artificial means had been used to produce it.

Class 142. *Salt Butter.*—Thirty-four entries. Quality generally good. Two entries were much too salt, and one was too mild.

This butter having been made a month, showed the effect of heat more than the fresh butter class, which has the advantage of being churned in cooler weather.

Joseph Matthews.
William Titley.

There was a very good show in Classes 135 and 136, of cheese made in 1877. The quality generally was very good, and the condition, considering the age of the cheese and the hot weather, was all that could be desired.

In Class 137 the competition was great, and the quality and condition were excellent.

Class 138.—The lots varied very much; there were some very fine cheese, but much of it was very middling, both in quality and make.

Class 139.—Many very creditable lots, but some that had better have been kept away, possessing no merit whatever.

Class 140.—Some very good cheese, but the competition was not so keen as in the other classes.

We are sorry to notice the absence of Wiltshire "Doubles," and think prizes should have been offered for this class of cheese. We also think it would have been advisable to have made separate classes for white and coloured in the two classes Nos. 137 and 138.

The show of cheese on the whole was very satisfactory, and we feel that the encouragement of the Society may well be bestowed on such an important article of consumption, whenever the Meetings are held in a cheese-making district.

James Hughes.
R. P. Edwards.

V.—*Report on the Exhibition of Implements at Bristol.* By J. Hemsley, of Shelton, Newark, Senior Steward.

In following the usual custom of the retiring Steward, by writing an Introduction to the Implement Report, I feel that it will be quite unnecessary to occupy the space of the 'Journal' at any length, the Council having engaged a gentleman so able and experienced as Mr. Coleman to write the General Report. I wish, however, to express in this public manner the pleasure I have had in serving my term of office, and to refer to the agreeable associations with all the officials connected with the Society. That pleasure will be better understood when I call to their remembrance the cordial and liberal receptions we met with on our visits to Taunton, Birmingham, Liverpool, and Bristol, and the Stewards have particularly to thank those several local Committees for their kindness. The duties of Stewards are certainly rendered as light as they can be, considering the great magnitude of our exhibitions; and if any improvement has been noticed in the general management of the implement department, and if more carefulness has been observed in the trials of implements and agricultural machinery during the past few years, it is largely due to the indefatigable and untiring exertions of the Secretary, and the able superintendence of the Steward of general arrangements, and to those gentlemen who have given their services as Judges.

The trials of agricultural implements during the last four years have been confined to mowing, reaping, and sheaf-binding machines, with the usual disposal of siver medals. With respect to the sheaf-binding machine, the highest honour of the Society has been awarded to it with the sanction of the Stewards after the late trials, although the Members of the Society

probably might have felt more satisfaction if a less dangerous material than wire had been used for tying.

It may possibly have been noticed that the Stewards lately have insisted upon increased carefulness in the disposal of the Society's silver medals for new implements, and that a much fewer number are given away than formerly. This action has been considered quite necessary; and although complaints are frequently made on that score, it must be admitted that if the Society's practical Judges, with the assistance of so able a staff of engineers, were to patronise with our medal an article which, however alluring this year, might next year prove worse than useless, the intention of the Society would be frustrated.

It may be thought that, after so long a term of office, some suggestions might be made as to the future, but I will only make two or three. Now that so many agricultural implements are struck off the list for future trials, it would be advisable to give any new selected machines which might be thought eligible for a medal, a more lengthened and thorough trial at a suitable season of the year than can be done in the week of the Exhibition, before their merits are endorsed with the Society's approval; and by this means a much greater value would be attached to the Society's silver medals than at present. I may add, that the Stewards have recommended that a perfected new machine, exhibited for the first time, may be eligible for a medal, although the same machine, in an uncompleted form, may have been exhibited at a previous show. It appears necessary that there should be better arrangement in the Showground for the exhibition of machinery in motion, as there seems to be an increasing desire for such on the part of the manufacturer. The general complaint is, that the Showyard is too large. To meet this, there might be a much closer weeding out of those articles not of a purely agricultural character from amongst those that are so, and, if the former are admitted at all, they should be placed in a part of the ground to be set apart for the purpose. The time also appears to have arrived when a classification of many of the most important agricultural implements and machinery might be made. Visitors would thus be better able to find the particular class they wished to see, and there would also be a better opportunity for comparison. I would also wish to see the Society's regulation as regards duplicates most strictly enforced.

With these few remarks I make my bow, believing that there is a larger legacy of increasing exertion left to my successors than I inherited four years ago.

VI.—*Report on the Trials of Sheaf-Binders and Miscellaneous Implements at the Bristol Meeting.* By JOHN COLEMAN, of Riccall Hall, York.

SHEAF-BINDERS.

IT will be in the recollection of those who take an interest in these machines, that the Judges at the Trials at Aigburth last year did not consider that either of the three machines then tried was sufficiently adapted for an English crop to justify the award of the Gold Medal. They, however, recommended, and the Stewards confirmed, the award of a Silver Medal to Walter A. Wood, and they highly commended the binding-mechanism of F. D. Osborne and Co. At that trial, as reported on by the late Mr. Jno. Hannam, only three inventions were presented, and these all by Americans. In this country it is only quite recently that attention has been directed to sheaf-binders, probably five or six years would represent the age of the oldest patents; whereas on the other side of the Atlantic it is twenty-two years ago that the first patent was taken out.

There is another reason why the Americans are so far ahead of us in this matter. There, enterprise has been stimulated by the greater certainty of the value of the prize that awaited the successful inventor. Here, it is only recently that the increasing difficulty as to labour has forced upon our conviction the importance of the invention. Again, it may be that the natural conditions of a riper crop, drier climate, and shorter straw, are more favourable to this class of machinery. This, however, is a subject for experience. English enterprise is now at work, and, crude as have been some of the attempts, we cannot doubt that in course of time we shall have machinery of our own, possibly more suitable for our crops than the inventions of our neighbours.

In gauging the progress of inventions in this direction, it must not be forgotten that the experimenter has very limited opportunities of practically working his machinery. The harvest lasts but a short time—three or four weeks at most—and then there must be a year's interval before the alterations which this short experience may have suggested can be actually tested. Consequently, it may be several years before practical efficiency can be obtained.

To Mr. Walter A. Wood, of Hoosick Falls, New York, much credit is due for having persevered with unflagging energy, and at one time amid much that was discouraging, in perfecting the various inventions combined in his machine.

The first patent referred to above was taken out by Messrs.

Watson and Renwick, examining solicitors in the United States Patent Office, and though, as is often the case, the original inventors did not make much of it themselves, it proved the basis of all the present successful machines. It is one thing to invent and another to successfully bring out an invention. I am indebted to Mr. Wood himself for the following particulars.

From the date of this first attempt, up to about eleven years since—*i. e.* the year 1867—numerous patents were granted by the United States Government, but nothing actually workable and that was worked was produced. In the year 1867 Mr. Wood commenced his experiments. In the two following years field trials were carried out, and in 1870 he had four machines out, two of which were sold. As far as Mr. Wood knows, these were the first successful automatic grain-binders ever made. I think it only fair to Mr. Wood to state that at one period of his work the Company whom he represented were not prepared to continue the experiments any further, probably daunted by the large capital absorbed without any apparent results. It was then that the progress and future of the invention hung in the balance, and depended on the unconquerable determination of one man, who never hesitated, assumed the whole responsibility, and now deservedly reaps the whole profits. Those who know nothing of the years of weary thought, and the thousands spent, may consider the machine far too costly at the price charged, but let them pause before they form their judgment, and hear what Mr. Wood says :—

"Taking the expenses of the eleven years I have had this machine in hand, which would include labour in the works and field, material, patents purchased, travelling expenses and freight, on account of testing the different experimental devices in the field, they would foot up over $150,000, and this is the third year it has brought me in any profits. No other builder of agricultural implements in our country gave the matter of an automatic grain-binder serious thought, until after I had begun to make a profit out of them. I do not think my competitors would object to my saying this. The numerous patents granted on grain-binders went to ingenious workmen without means to carry on field experiments, which were absolutely necessary to the bringing into use of a practical and successful machine. I happened to have the means and sufficient ingenuity to accomplish this, and was the first to do it."

Such is Mr. Wood's unassuming statement of an enterprise which has resulted up to the present time in the sale of somewhere about 12,000 machines. In order to prevent any misconception, I may mention that the fact of Mr. Lock's name

appearing on the binder-arm is in accordance with a contract entered into for fifteen years. In 1868 Mr. Lock, who has certain patents involved in the machine, entered Mr. Wood's employ, where he is still. The contract states that the name is to appear on the principal distinguishing feature of the machine, hence it is placed on the revolving arm. Neither that nor the twisting-pinion, however, were his inventions.

I trust that these remarks will not be misconstrued as in any way slighting to other inventors. Great credit is due to them—especially McCormick and Co., and F. D. Osborne—for the energetic way in which they have followed up Mr. Wood's lead in this important direction. As regards the former, some details may prove interesting.

Our readers may be reminded that the head of the firm at Chicago, Mr. Cyrus H. McCormick—still a hale, vigorous man—is the same individual who exhibited a reaping machine in our Exhibition of 1851. Mr. McCormick was present at the Bristol trials, and has kindly furnished me with some facts as to his connection with the Binding Machine, which promises to render his name even more famous than it became in 1851. It is four or five years ago that the manufacture of automatic binders was first decided on at the Chicago manufactory of C. H. and L. J. McCormick. And it was commenced after a visit paid by Mr. Cyrus H. McCormick to Canada, in order to witness the operation of a binding machine made by a Mr. Gordon, then owned by a Canadian Company of which he was a member, and which machine, whilst very imperfect in its construction and operation, embraced the reciprocating motion of the binder arm, which exists in the present machine.

An agreement was entered into, with a view to having the exclusive right to manufacture under their patents, and $20,000 were paid in advance, with certain other terms and conditions, one of which was the production of the patents for inspection at a certain stipulated time. In the meantime it was ascertained that these patents were invalid, a Mr. Withington being proved to be the original inventor of the reciprocating action, and eventually he was paid a considerable sum for his part of the invention found in the Gordon Machine, as well as for a differential gear, which was the original, though not at all arranged in the same way as the extremely clever and simple mechanism for twisting and cutting the wire which is now employed. Unless by those who had watched the progress of the invention, it would be difficult to recognise in the admirable machine of to-day the elements of Withington's patent. Change after change has been made, and many patents have been taken

out. The latest improvements, which were made by Mr. Cyrus H. McCormick himself, have adapted the machine to the requirements of English crops. In the year 1866 this machine, then in an experimental condition, was exhibited at the Philadelphia Centennial Exhibition, and even during that meeting, a new machine with several important improvements was substituted for the one which was first sent. During that summer much time was devoted to field trials, with such beneficial results that the firm were enabled to sell over a thousand machines for use in the harvest of 1877, fifty of them being sold in New Zealand. So successful was the work done by those machines that 800 machines have been sold in New Zealand for the last harvest (1878). Up to the period of Mr. McCormick's correspondence with me, the end of August, he estimates that over 6000 of the automatic binders have been sold by his firm in the United States, and that they have given satisfaction.

Before describing the machines which were shown at Bristol, a word or two as to the relative advantages of string or wire. Formerly there was, and to some extent there is even now, a strong feeling in England against wire, under an impression that it would be difficult, if not impossible, to prevent portions of wire passing through the threshing-machine, and eventually reaching an animal's stomach, where they would undoubtedly cause very disastrous effects. Mr. Wood's experience—who assures me that he has never had a single complaint under this head—might be deemed a sufficient answer that this alarm is groundless; but straw in the States, especially in the prairies and Western districts, is not much used for food.

Mr. Scotson, the intelligent tenant at Aigburth, near Liverpool, where the trials were held last year, reported that with two sets of nippers there would be no difficulty as to threshing; and he now assures me that no portions of wire remained with the straw, and consequently no injury resulted to his stock. It is evident, however, that great care must be exercised by those who are employed to use the nippers; and when no such precautions are taken, portions of wire will not only pass through with the straw and eventually cause serious injury to farm-stock, but it has been found in America, that the grain contains portions of wire, and this to an extent which seriously injures the miller's machinery, and reduces the value of the bran. The following is from 'The St. Paul and Minneapolis Pioneer Press' of November 14, 1878.

At a meeting of the Minneapolis Millers' Association, held yesterday morning, the damage resulting to mill machinery from the use of wire binders in the harvest fields, was brought up by the following report of a special committee to whom the matter had been referred:

"*To the Minneapolis Millers' Association:*

"GENTLEMEN,—Your committee appointed to investigate the question of damage by wire in wheat, respectfully beg leave to report:

"At the Washburn 'A' mill, we found the stones were marked and glazed by the wires passing through, and we were told that the bolting-cloths were frequently cut and damaged by the sharpened edges of the wire. Mr. McDaniel, the head miller, produced several quarts of wire, varying from one-quarter to two inches in length, which he said had been taken from the stones. He stated emphatically that the wire found in the wheat was a great damage to the mills.

"At the Pillsbury mills we learned that they had been greatly troubled by wire in wheat, at each of their four mills, damaging their brush machines, stones and bolting-cloths.

"At the Palisade mill we found that they had suffered much by the damage to brush machines and bolting-cloths.

"At the Model mill they say their brush machine and bran duster have been badly damaged, also bolting-cloths injured, by the sharp pieces of wire.

"In short, we found it to be the unanimous opinion of all the millers that the wire now found in wheat is doing great damage to mills. It is the unanimous opinion of your committee that the continued use of the wire binder will materially affect the value of wheat so bound.

"We earnestly recommend that the farmers discontinue the use of the wire binders.

"WILLIAM H. DUNWOODY,
"JOHN CROSBY,
"GEORGE HINELINE,
Committee."

After considering the above report, the Association adopted it, and the following:

"WHEREAS, The committee appointed by this Association to examine into and report upon the damage to mill machinery arising from the use of wire binders for wheat, having rendered a report recommending the discontinuance of the use of said wire binders, and said report having been accepted by this Association, therefore, be it

"*Resolved*, That whenever practicable a difference of ten cents per bushel, under corresponding grade, be made in the purchase of any wheat containing wire. And be it further

"*Resolved*, That we most earnestly recommend the discontinuance of the use of wire binders for binding wheat." *

It would be unwise to say that wire is the best material for a sheaf-binder; its comparative rigidity renders it more suitable in some respects than string, and possibly it may be found less perishable; and so far, at any rate, the machinery for its use is less complicated than that for string.

---

* In reference to the above resolution, it is evident that, in order to discourage the use of wire binders, the Association put a very exaggerated value on the damage. And it is also probable that the farmers neglected the use of the nippers, and allowed the sheaves occasionally, at any rate, to go into the machine uncut. After the experience of Mr. Scotson alluded to above, and the increased sale of the leading machines, we cannot believe that, with proper precautions, there is this liability to injury; but it is evident that, but for such precautions, very serious results may arise.

The following machines were exhibited at Bristol :—

Wire Binders.

No. 2853. W. A. Wood.
No. 2879. McCormick's (Waite, Burnell & Co.).
No. 2925. Osborn & Co.
No. 181. J. and F. Howard.

String Binders.

No. 2915. Johnston Harvester Company.
No. 2930. Hetherington & Co.
No. 2851. H. J. H. King.

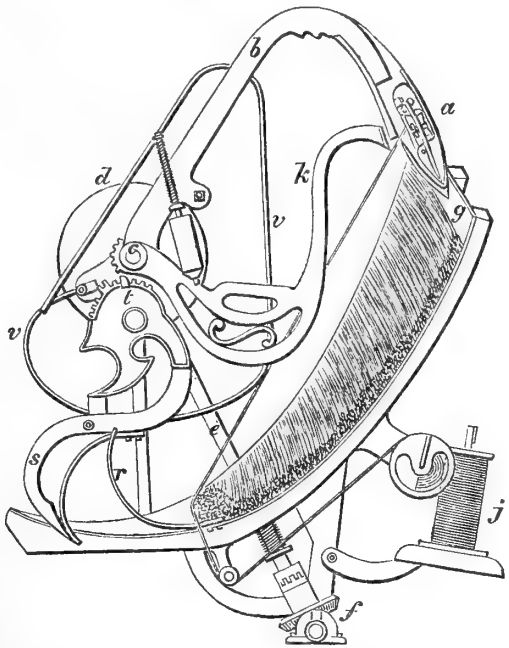
Melville Thompson Neale's Machine, entered in the Catalogue, did not reach the Showground until the Tuesday, and was then so manifestly incomplete, that it was decided that no further notice should be taken of it. Inasmuch as the first three Machines—*i. e.* Wood's, McCormick's, and Osborne's Reapers—have already been fully described in the pages of the 'Journal,' I only propose giving such details as relate to improvements recently introduced, or which elucidate the mechanism. For the somewhat detailed accounts of the machines, which appear for the first time, I am principally indebted to Mr. Anderson, the Society's Engineer, in whose company the examinations were made.

W. A. Wood (2853).—This machine has been so fully described in my Report of Philadelphia, and again last year by the late Mr. Jno. Hannam, that a lengthened description is unnecessary, and would be tedious. After the trials at Aigburth, certain alterations were suggested by the Judges, especially as regards the divider-board and the capacity of the platform. These have been attended to, and the result is that the machine is now more suitable for an English crop than before. The knife, which is serrated, clears about 5 ft., the depth of the endless web is also 5 ft.: this machine can therefore cut grain 5 ft. high. The knife being driven by pitman and connecting-rod in the ordinary way, the straw can be sheared close to the ground.

I am able, through the courtesy of Col. Griffin, Mr. Wood's leading representative in England, to give drawings and details of the binding mechanism, which have not appeared before, and which cannot fail to prove interesting; but, before doing so, I shall briefly notice the other improvements that have been made since 1877. The binding platform, which slides on a tram both above and below, has a range of 18 in., and is now controllable by means of a leverage worked by the driver. The gear can now be thrown in and out by the driver, without leaving his seat. The frame is raised by means of a chain and rack,

the platform-wheel being similarly altered by hand. The reel is now adjustable as to height, which was not the case formerly. The pitch of the fingers and the height of the cutter-bar can be altered from 2 to $9\frac{1}{2}$ in., by a leverage on a pole actuated from the driver's seat; any greater alteration is by the chain and rack described above. In the old machine the method of raising was by turning the sleeve with a lever, and holding the pinion in the rack by means of pins. The driving-wheel, 42 in. by 7, has now a flange on the outside $\frac{7}{16}$ square, to hold the wheel in wet or sidling ground. Inside the wheel is a wooden rim screwed to the wheel, to keep dirt out of the gearing.

Fig. 1.—*Showing the Needle of Wood's Sheaf-Binder entering the Grain.*

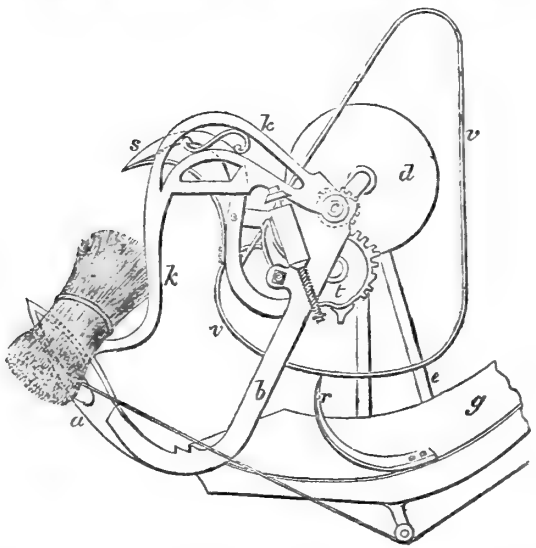


The binder-head *a* is carried by a bent arm, *b*, centered upon a shaft, *c*, and is rotated by bevel gearing, *d*, and a shaft, *e*, which is operated by the gearing *f* from the main bearing-wheel of the machine. The head *a*, in descending, passes within a slot formed by a division of the board *g*, on which the straws gather from the elevator, and the pinion *h* (Fig. 5, p. 81) in the head gears into the teeth of a rack fitted in the side of the slot to turn the pinion, and thus cause the two portions of the wire to twist. The wire having been previously led between the teeth of the pinion by the angle, one portion of the thread takes by the movement of the head, and the other by slipping into the recess *i* of the head as the head passes the binding point for the purpose of making the loop or band in which the cut straws are bound into a sheaf, this taking place at the

part of the slot just behind where the wire from the reel *j* enters the slot, the tension of the wire in forming the band being governed by the compressor arm *k*, whose outer end forces the wire round the sheaf, while the head follows for binding operations. When the wire enters the recess *i* (Figs. 3 and 4, p. 81) of the head, it passes into the jaw of a cutting plate, *p* ; and as this plate, which is centred, turns on its pin by a lug, *q*, striking a projection in the slot of the board directly after the twisting has taken place, the wire is severed by a cutting action, and the end leading to the reel is held fast by the shoulder of the cutting-plate to enable the head to carry the wire up for the next binding operation.

The compressor-arm *k* is upon the same shaft as the binding-arm, and turns for a part of the distance at the same speed, but directly the severing of the wire is effected the binder-arm stops, the compressor-arm alone continuing its travel, which raises the newly bound sheaf clear of the binder-head, and tilts it over on to the ground clear of the machine, which continues its travel. While the compressor-arm is producing the sheaf upon the board, the straws bear against a pair of tender steel strips, *r*, and against a curved arm, *s*, which is acted upon by irregular shaped teeth on its hub *t* engaging into teeth on the hub of the compressor-arm, the two arms being thus caused to approach each other for the formation of the sheaf.

Fig. 2.—*Showing the Position of the Compressor-arm of Wood's Sheaf-Binder previous to the Discharge of the Sheaf.*



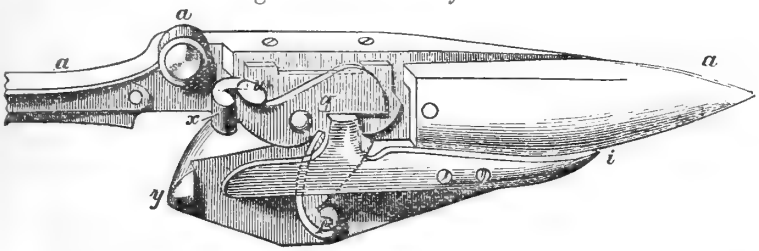
As soon as the sheaf is complete, the curved arm has a quick movement imparted to it to get it clear of the sheaf, which is then raised and thrown over the head on to the ground by the compressor-arm as before stated.

The accompanying engravings, Figs. 1 and 2, represent two positions of the binder-head and its accessories. In Fig. 1 the head is shown just entering the slot of the board, and the compressor-arm moving with it to collect the straws into a sheaf, the straws at the bottom of the board resting against the wire. When the compressor-arm has moved a certain distance towards the lower end of the board (to the left) the curved arm moves to the

right, and relieves the wire from the strain, the two arms then form the sheaf. The head has during this stage been moving comparatively slowly, but it continues its travel to drag the wire around the sheaf. The compressor-arm and the curved-arm stand still at this point until the one portion of the wire has crossed the path of the other portion by its engagement in the jaw of the head, and the twisting and severing operations have been performed, when all parts of the mechanism take fresh positions for a repetition of the operation.

The details of the binder-head will be understood by the detached views, Figs. 3, 4 and 5. Fig. 3 is a side view of the head, with the plate in posi-

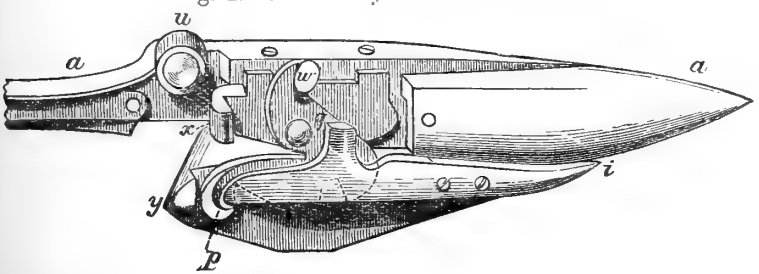
Fig. 3.—*Side View of Head.*



tion for the wire to pass through the recess into the jaw of the plate, whereby the wire also enters between the teeth of the pinion which is in the back of the head,—the end of the wire, which has been held by the head and taken round with it, being between other teeth of the same pinion, so as to cause the two portions of the same wire to be twisted when the pinion is turned.

Fig. 4 represents a similar view of the head with the plate in position, after

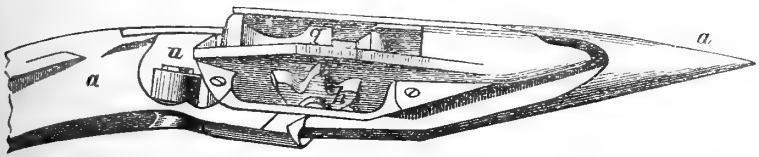
Fig. 4.—*Position after Wire is severed.*



having severed the wire, and holding the free end of it ready for the next bind.

Fig. 5 shows the back of the head, with the pinion and plate in the

Fig. 5.—*Back View, showing Pinion and Plate.*



hollows provided for them. The small roller *u* enables the head to ride upon the board and assists in guiding the head in its travel in the slot; *v* is a

bent stout wire, as a guard to press upon the straws and prevent them entering between the gear work.

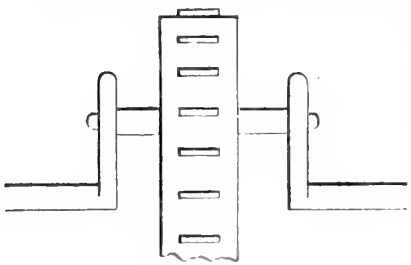
When the twisting operation of the wire-ends is being effected, the end of the wire which has been held by the plate p is released, the plate turning on its centre in the reverse direction by the nose w of the plate striking against a projection in the slot of the board; directly after this the opposite nose q is struck to sever the twisted wire and to take hold of the end then formed, and to retain its hold until the next sheaf is tied.

The projecting lugs x y limit the movement of the plate p.

No. 2879.—*Waite, Burnell, Huggins, and Co.*, of 228, Upper Thames Street, exhibited the improved harvester and binder of C. H. McCormick of Chicago. This machine having been described in my Report of the Philadelphia Exhibition in 1876, and the same description having been repeated by the late Mr. Hannam in his Report of the Liverpool trials, I shall content myself with alluding to certain improvements in details, and give some simple illustrations explanatory of the binding mechanism.

The platform has been enlarged so as to meet the requirements of English crops. The driving-wheel is 40 inches in diameter, with a 9-inch face, which carries a number of clogs or projections, $\frac{1}{2}$ inch by $\frac{3}{8}$, which occupy about 5 inches of the centre of the face. The mechanism for raising the reel, and altering its position in reference to the knife, is very simple and good, although it has this disadvantage, that the two motions being combined, height and position are adjusted at the same time, and it is not possible to regulate them independently. Practically this is not of much importance, for when it is desirable to have the reel in a forward position, it is also desirable to have the axle of the reel as low as possible, in order to pick up grain that is down. The driver has perfect command of the reel, and can adjust the knife-bar from 3 inches to 9 inches. Greater height of cut can be obtained by means of a bridle with holes on each side of the main driving-wheel, by altering which the height can be raised to 16 inches from the ground (see Fig. 6). The binding apparatus and cover, 3 feet 6 inches wide, slides 11 inches, in order to regulate the position of the band according to the length of the straw. This is effected by a screw and chain. The chief improvements are:—An adjustable paul or conveyor-wheel, which drives the twister, by which any wear

Fig. 6.—*Bridle to regulate the height of cut in McCormick's Sheaf-Binder.*



on the drive-chain, which would otherwise cause the twister-case to get out of the exact position necessary to receive the wire, can be regulated. A cam, with a paul working in it, holds up the binder when it is returning to the grain. This was formerly arranged by lugs connected with the link, which were apt to get out of order. It will be remembered that the wire is supplied from two spools, and that each band has two twists. A pay-off in connection with the lower spool supplies a given quantity of wire, being about one-third of that which is given off from the upper spool. The use of two wires and two fastenings is claimed as an advantage, allowing of simple and more durable mechanism, no clamping apparatus for holding the end of the wire being required, and no knife, as the differentiated gear, acting on the two wheels of the twister at a particular portion of their traverse, causes the teeth to close and cut; each tooth can thus act as a knife. This will be understood by reference to Fig. 14, p. 87.

Fig. 7 shows the position of the binder-arm when brought up to the inflowing grain, previous to its descending and enclosing the corn. The wire from the upper and lower spool is shown passing over pulleys at the end of the binder-arm and compressor.

Fig. 7.—*Position of the Binder-arm of McCormick's Sheaf-Binder before enclosing the Sheaf.*

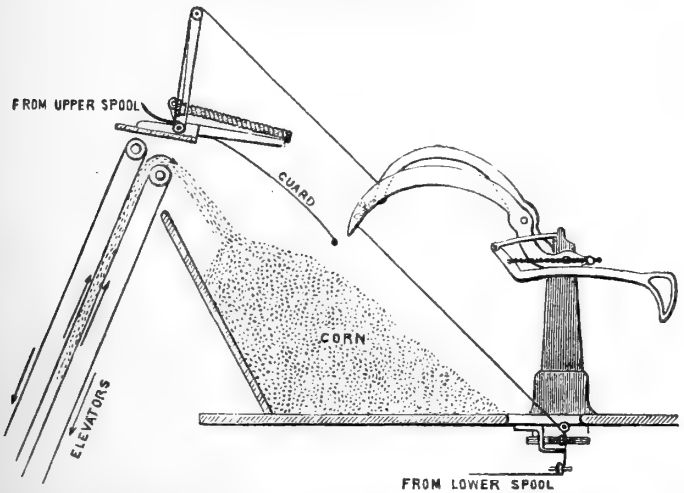


Fig. 8 shows the position of the arms after binding the sheaf. The base of the binder-arm having liberated the jointed arm behind, the latter, actuated by the springs, drops and meets the compressor-arm under the sheaf. The position of the two wires

in reference to the twister is more readily understood by reference to Fig. 9.

Fig. 8.—*Position of the Arms of McCormick's Sheaf-Binder after binding the Sheaf.*

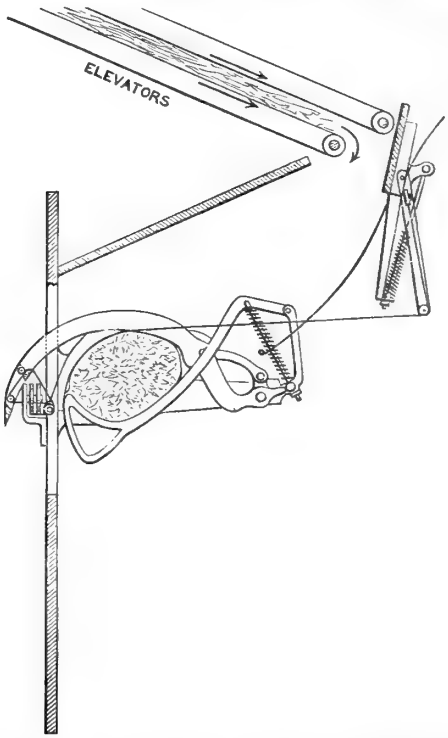


Fig. 9 shows the point of the binder-arm descending into the grain.

Fig. 10 shows the position of the binder-arm and wires preparatory to the operation of twisting.

Fig. 11 shows the action of the pinions after the first revolution.

Fig. 12 shows the twist completed and the wire cut. It will be seen that a second twist has been made below the pinions at the same time. This is done in order to maintain a continuous wire, and does away with the necessity for holding-jaws.

Fig. 13 shows the different positions of the wire, according to the progress of the operation.

Fig. 14 is an excellent representation of the twister-pinions and differentiated gear of the segment. The fact that the upper teeth of the segment are more numerous than the lower ones causes the teeth of the two pinions to close at a particular point of their

Fig. 9.—*Point of the Binder-arm of McCormick's Sheaf-Binder descending into the Corn.*

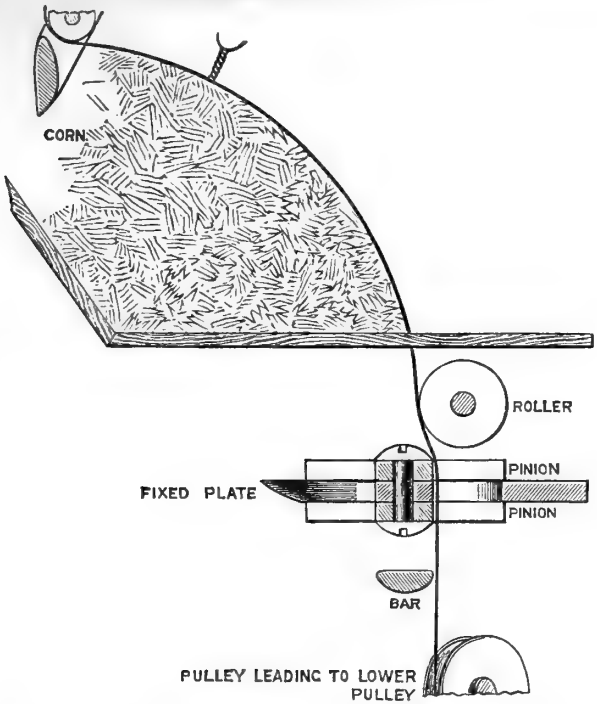


Fig. 10.—*Position of the Binder-arm and Wires preparatory to twisting.*

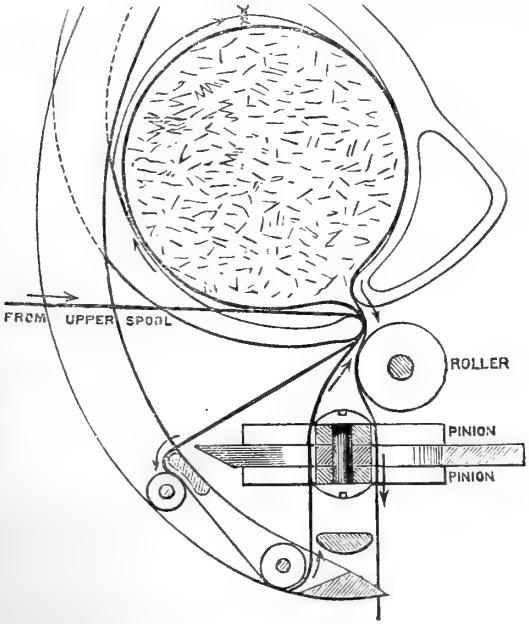


Fig. 11.—*Action of the Pinions after the first revolution.*

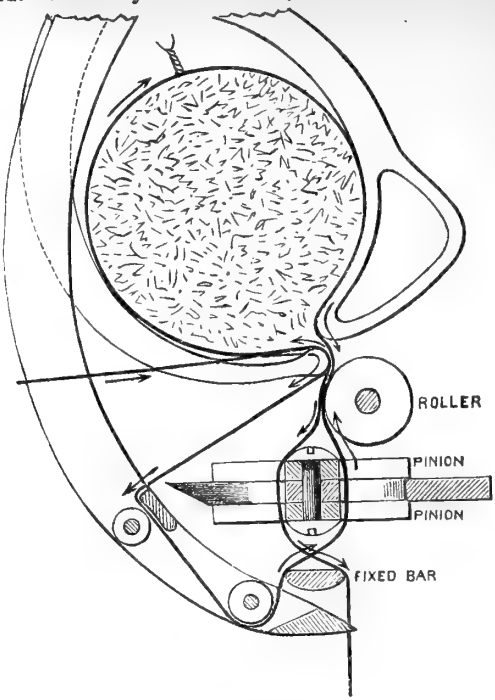


Fig. 12.—*The Twist completed and the Wire cut.*

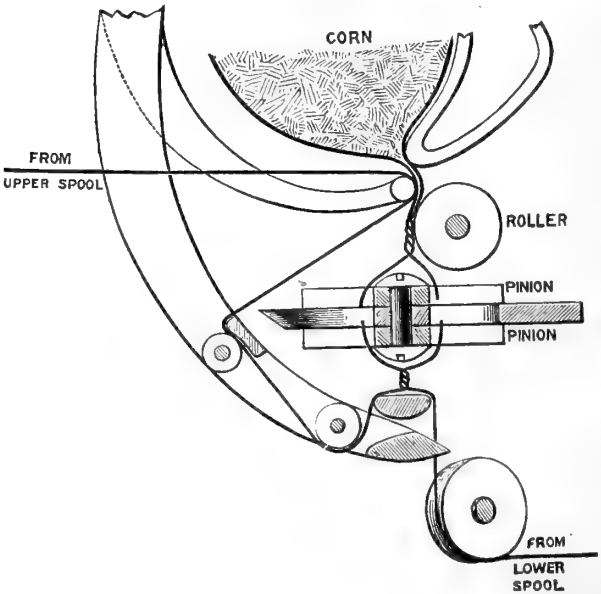


Fig. 13.—*Different Positions of the Wire in the progress of the Binding-operation.*

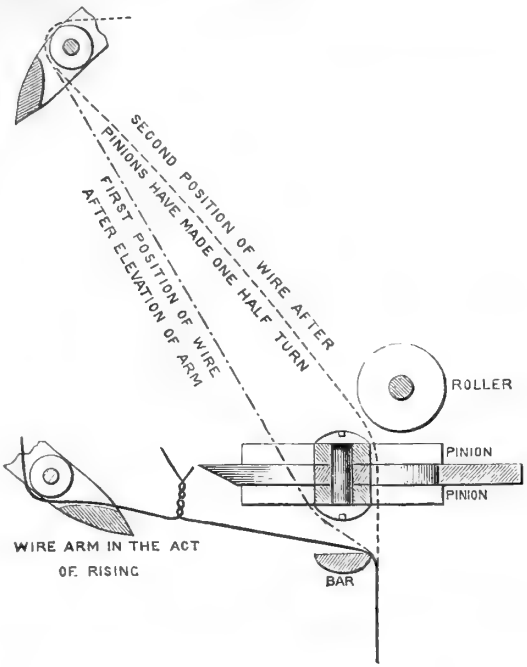
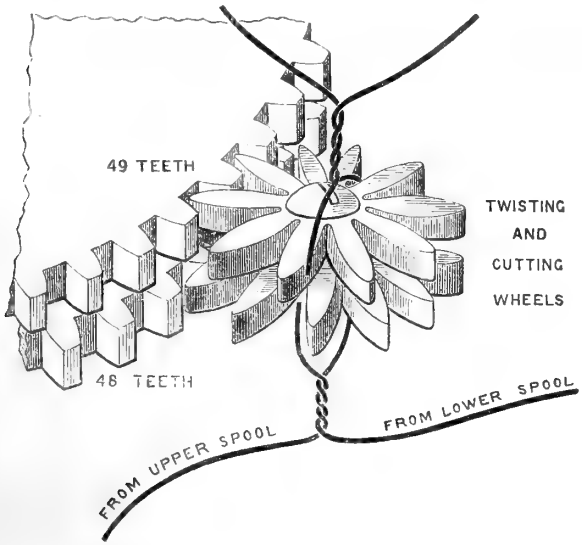


Fig. 14.—*Twister-pinions and differentiated Gear of the Segment.*



traverse, when the twisting is completed, and when it is necessary to sever the wires. This is a very ingenious and simple arrangement, which appears to answer admirably.

There may be some objection to having two twists, inasmuch as there are four ends instead of two, which makes the sheaf more difficult to handle; but this is really of very little consequence, and there is no doubt that there is very little in the mechanism to wear out or get out of order.

As the machine shown by Osborne and Co. was in all respects identical with the one tried at Liverpool last year, and was very fully described in the late Mr. Hannam's report, no further description of it is required. A new machine, with modifications designed to meet the requirements of an English crop, was expected from Paris, but did not arrive in time for the trials.

Messrs. J. and F. Howard, of the Britannia Works, Bedford, appeared on the scene for the first time with a self-binder with wire; and it may be here remarked that, so far, this firm are the only English makers who employ this material. All the other inventions attempt to deal with string, a fact which indicates the strong feeling—probably, to some extent at least, prejudice—which has existed in this country against the use of wire, and which might be greatly modified, if not entirely removed, by experience. There are several features of this machine which are commendable, and I therefore shall not apologise for introducing a somewhat detailed description.

The knife is 4 feet 8 inches long, with smooth sections; fingers 3-inch pitch, of malleable iron; depth of platform, 5 feet 6 inches, giving considerable capacity for dealing with long-strawed crops; width over all going way, 11 feet 3 inches: depth of machine, 9 feet. In its present form this machine cannot pass through ordinary gateways without being placed on a trolly. This and many other minor points require improvement. The driving-wheel is 3 feet diameter, with 7-inch face, and carries Messrs. Howard's lantern-wheel gearing. The intervals between the teeth are open, in fact a sort of skeleton-wheel, through which dirt can pass. The platform-wheel is 2 feet 3 inches diameter, made of wood, with iron tire and hub, raised by means of a slot and two screws. The frame is of wood, and the apron and elevators are made on the American model. The knife is capable of being varied as to height of cut from 3 to 6½ inches by the driver.

Motion is communicated from the driving-wheel to a cross-shaft by means of the annular lantern-wheel (already alluded to) engaging a pinion. On the said shaft is a bevel-wheel driving a bevel-pinion on a longitudinal shaft, put in and out of gear by a clutch actuated by a lever from the driver's foot. At the forward end of the same shaft is a sproggle-wheel to drive the upper roller of the elevators; and at its extremity the crank-disc actuating the knife connecting-rod, which is made of wood, the knife-bar being of angle-iron. The cross- or last-motion shaft at its extreme outer end carries a pinion with clutches under control by the driver's foot, which drives a spur-wheel on a second cross-shaft; on the outer face of the said spur-wheel is cast a bevel-wheel, which engages into another on a second longitudinal shaft, which carries at

its forward end a cylindrical cam which actuates the lower end of a vertical lever, the upper end of which has a segmental rack connected with the tying mechanism, the lever being kept up to the cam by a spiral spring. On the rear end of this same longitudinal shaft is an eccentric sproggle-wheel, which drives a corresponding wheel on a third longitudinal shaft, near the ground on the extreme outside of the machine, actuating two forks or prongs for discharging the sheaf when tied. On the extreme rear end of the second longitudinal shaft is a crank, the connecting-rod of which actuates a corresponding crank on the rear end of a longitudinal rocking-shaft at the top of the machine which carries the binder-arm. The wire-reel is carried by a bracket beside the binder-arm and above the sheaf. The tension on the wire is regulated by a spring-friction brake pressing on the wire. On the axle of the wire-reel is pivoted a lever, hooked at its outer end, and hollowed out to carry the wire, the office of which is to take up the slack; the tail end of the said lever is bent up at right-angles, and actuated by a pin on the side of the binder-arm, the end of which is merely slotted to carry the wire within a small friction-roller.

I will now endeavour to describe the binding mechanism, which, unfortunately, I am not able to illustrate by drawings. The binder-arm, when it has moved forwards towards the elevator, strikes into an india-rubber adjustable cushion placed on an arm at right-angles to the vertical bracket which carries the tying mechanism. The end of the wire is at this point held by a spring clamp on the inside of the twister; the wire then passes through the front of the arm under the grain as it falls on to the binding-platform, to the slack lever which is up. The rack already described is now right over to the rear, having been brought into this position by the action of the cylindrical cam on the same shaft. The binder-arm now retires, causing the wire to loop round the top of the spring-clamp; and as the end of the arm clears the twister, a spring lever, which had been held up by the arm, drops on the wire and forces it into the twister. The binder-arm continues to rise, during which time the rack moves slowly forward by the action of the cam, and causes the twister to revolve without any action except to bring the wire to the bottom of the pinion, and thereby allow of the upper wire coming into place. The binder-arm now descends, enters above the twister, and the wire is forced down by the action of a second lever, actuated by the same spring as that which brought the wire before into the upper portion of the twister-pinion, which has been already described. The said lever remains down during the operation of twisting, keeping the wires close together, and assisting the twister, and when the twisting is effected it is released by the cam and pulled back by the spring into its former position; the segment being at its extreme forward position, and being held there by the cam.

The rack segment on its inner face carries two cutting-knives, the outer of which shears the wire off the face of the twister, and the inner one has a double action; its lower face drives the wire into the spring-clutch, which holds it, and the upper edge cuts the loop which has been formed as already described; the said loop being thus liberated, falls into a receptacle below. Such is a brief description of the mechanism, which I fear will hardly prove intelligible to those who have not seen the machine in action. In reality the mechanism is simple, and the manner in which the wire is held by the loop is both simple and efficient. The wire is twisted two and a half times, which is quite sufficient for durability. The reel for collecting and directing the corn on to the platform is carried by an adjustable wooden arm. The reel can be raised or lowered by altering the position of a bolt, but is not controllable by the driver. It is driven by pitch-chain and tension-gear from the axle of the driving-wheel. The elevator consists of four rubber-bands, carrying cross-laths with iron fingers. These revolve between fixed wooden boards, the corn

being pressed on to the pins by a spring frame. The binder-arm and platform cannot be moved by the driver; and in order to shift their position, according to variations of crops, bolts have to be removed, and then the range of traverse is only 4½ inches. Improvements in detail as regards this point and the adjustability of the reel are desirable, and may, we think, be readily made. It will be seen from the description of the trials that the platform arrangements are too imperfect to allow of successful work. The corn, cut and well laid on the lower platform, could not be properly elevated to the tying mechanism. In other respects the machine is well made, and reasonable as compared with others, the price being 60*l*.

The machine shown by the *Johnston Harvester Company*, of Brockport, New York, and 1 and 2, Chiswell Street, London, is described in the Catalogue as an automatic twine-binder, which is hardly sufficiently descriptive. A string-knotting machine would perhaps be more accurate. I shall endeavour to give my readers some idea of the construction of this very ingenious machine, which, complicated as it may appear, succeeds in making an excellent knot, which cannot come loose. The basis of the machine is an ordinary American harvester, from which the binding apparatus is easily detached for travelling by removing one bolt, when the whole gear slides on the frame and is taken off. This reduces the entire width over all to 9 feet 8 inches, and makes it possible to pass this machine through an ordinary farm gate, which cannot generally be done.

Some few details as to the general features may be admitted. The knife, 4 feet 9 inches, has serrated sections, and is driven from its centre by connecting-rod and lever from behind the frame. The fingers are of wrought iron, with 3-inch pitch. The horizontal platform consists of the ordinary travelling web; the elevator comprises two chains (malleable iron), carrying cross-laths of wood furnished with iron teeth. There is an additional chain, with similar iron teeth on the front side in advance of the knife, which is of use in carrying up the butts of the straw. The driving-wheel, 40 inches diameter and 7 inches tire, comprises two iron hubs, 11½ inches apart, held together by 4½-inch bolts, which, being drawn together, force the spokes, sixteen in number, set bracing, up to the tire. This makes a very strong and light wheel. The platform-wheel, 28 inches diameter, is of wood, with an iron tire. I hope that the mechanism by which the various motions are obtained will be understood by the accompanying description.

Motion is transmitted from the driving-wheel by a spur-wheel, gearing into a pinion, keyed on a short cross-shaft in the rear of the machine, on the other end of which a bevel-wheel engages a pinion on a longitudinal shaft acted on by a spring clutch controllable by the driver, which throws out of gear all motions except the reel, which is driven by a sproggle-wheel and pitch-chain from the axle of the driving-wheel. On the rear end of the longitudinal shaft is a sproggle-wheel, actuating by a pitch-chain a second longitudinal shaft on the outside of the machine which drives the binder; next on the first-named longitudinal shaft is a pulley, which also serves as the crank-disc for the knife, and which drives by a rubber-band the upper shaft of the elevator, and the outer roller of the platform-apron, tension-pulleys being applied as required. The sproggle-wheel on the second longitudinal shaft is thrown in and out of gear by a spring-clutch from the driver's foot, who can thus regulate the size of the sheaf by

suspending the revolution, for as long as he likes, of the binding-arm. On the forward end of this shaft, which is near the ground, is a pinion which engages a spur-wheel on a third longitudinal shaft. On the forward face of this spur-wheel is a crank-pin actuating two connecting-rods; one of these works inwards to a swinging-lever, from the lower joint of which a return-rod rocks the binder mechanism across the machine towards and from the inflowing grain pivoting on the shaft. The second connecting-rod is jointed to the binder-arm, and gives the necessary up and down motion. From the joint of the binder-arm a spiral spring actuates a forked compressor which follows the motion of the binder-arm. Behind the spur-wheel on the third shaft is a mutilated bevel-wheel, one-third of its circumference being toothed and the rest a plain cone. This engages into a pinion on a short upright shaft; the lower part of the pinion has a flat stop, which bears against the cone and prevents its turning whilst the gear is disengaged. The upper end of the upright shaft carries a crank, the horizontal connecting-rod from which passes to the rear of the binder-platform and operates the knotting and string-cutting mechanism by a reciprocating horizontal motion. The reel of string is placed at the heel of the binder-arm, and the string is carried round a pulley or swinging-jaw for taking up the slack and guiding the string-arm over a fixed pulley on the top of the binder-arm, and through another pulley in the eye of the needle, which is a brass trough-shaped casting. It now remains to describe the really extraordinary movements by which the very difficult operation of tying the knot is effected. I confess that this is quite beyond my powers, and I can only give the result. It is not even true to say that it must be seen to be understood, for my indefatigable colleague Mr. Anderson, to whose admirably lucid descriptions I am indebted for so much of this report, had to place himself in various uncomfortable positions before his experienced eye could detect the why and wherefore. Briefly, however, this is the result. One end of the string is held by a spring clamp or jaw, the other end is brought down by the arm, having the sheaf between them; then the two strings pass through a pair of tongs, which do not travel, but make a single revolution, and they are closed by the forward motion of the box. The tongs seize both strings, and so form the loop round themselves by a turning motion; then through the hollow centre of one tong a hook protrudes which catches the cross portion of the loop and draws it through, making the knot complete. The cutting is done at the same time, and the operation is finished. The cutting is by a pair of shears immediately under the tongs. The binder-platform can be varied in position about 15 inches, being actuated through a simple rack and pinion by means of a hand-wheel within the driver's reach. There is necessarily a gap between the binding mechanism and the binding-platform to allow of the binder-arm operating, and this is filled up by sacking, attached at the rear-end to the binding mechanism, and at the front-end to a roller actuated by a spring, which keeps it tight, according as the size of the opening varies with the movement of the binder-arm. The binder-attachment is all carried on a single bed-plate, pivoted to one stud-bolt. The reel, which is overhung, comprises a wooden shaft, kept level by bearings, and controlled as to its position, which admits of considerable variation, to suit difference of crop by lazy-tong-arms. The reel can be raised or pushed backwards or forwards by the driver without leaving his seat.

Hetherington and Co., of Manchester, appeared for the first time with a string-twisting machine, of which the main features are based upon King's invention; indeed, I believe this firm manufactures under a royalty from him. I am indebted for the following excellent description to Mr. Anderson, who devoted much time

in mastering the somewhat complicated mechanism by which the required motions are produced:—

It may be as well in the first instance to give details of measurement, premising that the foundation, as in King's, is one of Samuelson's ordinary Eclipse Manual Reapers with double throw of knife.

	ft.	in.
Width of cut	4	3
Depth of platform	5	0
Width over all running way	8	6
Ditto at right angles	10	6
Weight, said to be about	21 cwts.	
Driving-wheel, smooth	28″×8½	

The platform at the rear of the knife is slotted in a direction parallel to the knife-bar, to allow the traverse of five iron rakes, which project up through the slots 18 inches; they are slightly hooked at their upper ends towards the binder, and have a traverse of 5 feet 6 inches. The platform is horizontal as far as the width of cut, it then rises towards the binder; the two sections, as will be hereafter described, are hinged, and have a certain amount of rocking motion. The rakes traverse from the extreme outer side of the platform to close up to where the sheaf is tied; when they reach the limit of travel towards the binder they fall back below the platform, return to the outer side of the machine underneath it, in a horizontal position, and rise up again to rake the freshly cut corn. The rakes are keyed on to a rocking-shaft, which is kept in two positions by spring catches. In the one position the rakes are up and advancing to the binder; when they reach the end of their traverse the catch is drawn aside by coming against a wedge-shaped stop, the end of which, as soon as the catch is drawn out, strikes against a stop, and turns the rakes down below the platform, and in a similar manner at the end of the return stroke the rakes are released and raised. The motion of the driving-wheel is communicated by means of a pinion to a short shaft and bevel wheel capable of being connected by a clutch actuated by a lever under the driver's control to an inclined shaft, the lower end of which carries the disc-crank which actuates the knives, while about its centre is keyed a bevel wheel which engages with another actuating a vertical shaft, which by means of a tangent screw causes a short shaft, on a higher level than the inclined shaft, to revolve, and also by a worm drives the reel.

The forward end of the short shaft last described carries a crank, the pin of which engages into a slotted lever, the lower end of which is furnished with a bevel-toothed segment which actuates a corresponding segment on the short end of a curved horizontal lever, the long end of which is connected by a rod to the axis of a small spur wheel, one side of which runs in a fixed rack under the platform, and the other side in a movable rack, the outer end of which is secured to the rocking-shaft which carries the rakes. By this arrangement the stroke of the lever is doubled in a very simple and efficient manner.

Binding Mechanism.—Under the raised outer portions of the platform is a rocking-shaft, the rear end of which carries the curved binding-lever, and the forward end has a crank actuated through a pair of links by a swinging-lever furnished with a curved slot, into which engages the pin of a crank secured in a crank-disc keyed on the rear end of the shaft last described. The reel holding the string is placed near the ground on the outer side and in rear of the platform; the string is carried inwards through a short bell-mouthed pipe, and then upwards through a tube along the binding-arm. The upper end of the tube is furnished with a light spring, which presses on the string and locks it in the event of its tending to slip backwards and become unthreaded. From this tube the string passes through a double wedge-shaped projection or string-

guide on the side of the lever, and is led to a spring clamp or catch in the twisting box, where it is firmly held.

The two sections of the inclined platform, which have been described as hinged at their lower ends, have their upper extremities connected by links to a rocking-shaft, round which is wormed a spiral spring, which always tends to keep the sections raised up so as to consolidate the straw being tied. When the straw is first delivered these have to be depressed, and that is done by a crank at the forward end of the rocking-shaft, which is operated on by a cam keyed on the shaft, and which forms, in fact, the crank-disc operating the rakes. The same cam, by means of tooth-segments, operates simultaneously a second rocking-shaft, also enveloped by a spiral spring, and which carries two hooked prongs, which serve to compress the straw against the binder-arm, and a third prong on the opposite side, the office of which is to throw off the finished sheaf.

The box containing the twisting mechanism stands vertically over that portion of the platform where the sheaf is formed, but it is pivoted so that it can turn down through about 45° to a horizontal position still at right angles to the sheaf, and this movement is communicated by a lever on one end of a rocking-shaft enveloped by a spiral spring, and actuated from its other end by a rack-segment lever, the lower end of which is brought into action by a cam disc keyed on the middle of the shaft. The upright or vertical shaft, by means of bevel gear, drives a pulley, which actuates by friction a smaller wheel keyed on a light shaft not quite horizontal, the other end of which passes into the twisting box and sets the twister in motion. The shaft is arranged so as to fall over with the box, keeping always in gear with its driving-pulley, so that the operation of twisting can continue in all positions of the box. On the opposite side of the cam disc which works the box is fixed a catch which engages into a lever connected by a pair of links to one end of an upper rocking-shaft enveloped in a spiral spring, the other end of which carries a peculiar shaped lever or cam, the office of which is to raise the spring knife which cuts the string, to hold or release the box, and to guide the head of the twister spindle so as to make it assume the proper position at the end of each operation. The twister spindle, which is vertical in the box at the commencement of the tying, is furnished at its lower end with two spring-clamps or jaws, with V-shaped guides leading to and from them; these guides are entered by the wedge-shaped pieces through which the string passes on the end of the binder-arm, and are thus forced open to allow the string to be drawn through and clamped. The spring knife acts vertically, is placed close beside the twister, and is released by a pin on the binder-arm as soon as the string is passed through the clamp and secured, when it is immediately cut before the twisting begins.

The wedge-shaped string-guide in the end of the binder-arm has a short play along the arm; it is kept up by a spring, and on its rear end has a wedge-shaped pin which works through a slot in a portion of the framing opposite the box. In this slot there is a shunt piece which makes the string-guide pass towards the platform at a lower level than when advancing to the binder, so as to make it pass through the lower clamp.

The process of making the sheaf is as follows:—The string projects a couple of inches through the string-guide in the binder-arm. The arm moves over towards the platform and sinks below it. The box is vertically over the platform, and in passing it the string-guide on the binder-arm has passed through the lower clamp and left the end of the string fast in it, and the string stretched between the box and the platform. The corn is now raked up the inclined platform, pressed against the string, the binder-arm rises and clasps the corn between itself and the two holding prongs and the rising platform; in doing so the string-guide passes between the upper clamp in the twister, and

is immediately cut off. The twister begins to revolve, twists the two ends of the string together, holding them vertically over the sheaf. The box then falls into the horizontal position, the twisting is continued, but, as the twisted portions lie alongside the string surrounding the sheaf, the two twist together, and have the effect of tucking the twisted part two or three times between the straw and the band. As soon as this is complete, the string is released by the end of the pin passing through the hollow twisted spindle, being pressed down by a lever actuated by a cam on the rock shaft releasing the box, and the sheaf is thrown off by the prong provided for that purpose. The lever which released the box draws up the knife ready for a fresh cut, and the box, on returning, has its cams adjusted to the correct position by the same cam-shaped lever and wedge-shaped termination of the twisted spindle. The string is about $\frac{3}{32}$ in. diameter, and is twisted the reverse way of the lay. The knife is a thin blade passing between two fixed guides. There appears to be some difficulty in cutting the string. The reel, which is worked for the vertical shaft by a worm, cannot be moved backwards or forwards in reference to the machine. It comprises 6 arms, one of which terminates in a feathering brush, intended to push the corn to the platform. The feathering is done by means of a cam keyed to a sleeve on the reel-axle. The sleeve can be turned round by a tangent screw and wheel, so as to regulate the point of feathering in the revolution; the feather is worked by a roller running on a cam, and actuating a lever against a spiral spring; the outer end being jointed to a crank on the brush shaft.

***H. J. H. King's* Sheaf-binding Machine, to tie with string, No. 2852, was shown at Liverpool last year, but was obviously then in an incomplete state, indeed it was more as a model than a practical reaper. Much has been done in the interval, and although the workmanship is rough, and further alterations, especially with a view to simplify the mechanism, are desirable, it is sufficiently complete to require description. I am sorry that I have not been able to produce detailed drawings, which would have been of use to my readers in helping them to understand the construction of the machine.**

The basis of this machine is a Samuelson reaper, and the gearing is of course similar as regards the cutting parts. Thus the knife is 4 feet 3¼ inches long; depth of platform, 5 feet 1 inch; width over all going way, 8 feet 6 inches, which allows of the machine passing through ordinary gates; depth, 9 feet 6 inches. The reel is fixed, and comprises three ordinary fans and one collecting brush, which sweeps the corn up a concave platform, feathering away when the work is done, this action being secured by means of a cam on the reel-shaft, which is not self-adjusting, but can be altered by shifting a screw. At the back of the first platform is a transverse platform which receives the grain as it is swept up by the brush. This consists of fixed boards with five openings or slots at unequal distances, for the traverse of the rakes, five in number, which move backwards and forwards, and rise and fall by mechanism similar to that in Hetherington's reaper, which is shown as a modification and improvement on this machine. The stroke of the rakes is 5 feet 6 inches, they drop and clear themselves differently. The platform rises towards the binding mechanism about 6 inches, and is fixed. The driving wheel is 2 feet 8 inches diameter, width of tire 7½ inches. The driver throws the machine in and out of gear by a clutch. A bevel wheel on the axle gears into an inclined shaft, which carries at its forward end the crank-disc and knife

connecting-rod, and behind Robinson's friction gear for working the twister. The tying mechanism is all below, and looks as though it were rather near the ground for practical work. An upright shaft, which drives the reel at the upper end, has at its lower end a crank, the pin of which works in the slotted end of a long lever which actuates the rakes. Above is a rocking-shaft with spiral springs round it, the rear end of which carries the binder-arm, and the fore end a crank with a roller pin, which runs on a cylindrical cam on the upright shaft. A little below is a second rocking-shaft, which carries four arms for compressing, and two for discharging the sheaf. This also is surrounded by a spiral spring, and its forward end carries a crank with a roller pin, which runs on a cylindrical cam at the base of the one just described. The binding mechanism is below the platform, and consists of a pair of spring clamps or jaws actuated by a pair of spur wheels at its lower end, the forward wheel being on a vertical shaft driven by the Robinson friction gear. The string, in a box above, is carried down the binder-arm in a channel, and passes through a string-guide or double-ended wedge. The box rocks on the end of a hollow horizontal shaft, through which the twister spindle is carried; this shaft is linked by a pair of cranks and short links to a second hollow parallel shaft, to the forward end of which is secured a crank kept up by a spiral spring, and connected by a vertical link to a swinging-lever which carries a roller pin running on the under side of the lower and larger cam on the shaft. Through this hollow shaft is the knife-rocking shaft, which terminates in the forward end in a crank kept up by a spiral spring, and actuated by a vertical link with a roller on its top, and also working on the under side of the cam as described. There are, in fact, four cam motions from the shaft, and the whole of the motions for the rakes and tying machinery are effected by one revolution of this shaft, always excepting the motion of the twister. The lever which actuates the knife has a tail through which the twister spindle passes, and is placed in and out of gear by its action. The same motion lowers the shaft which carries the box, and so enables the string-guide and the binder-arm to pass through the upper clamp. By an ingenious arrangement the stroke of the rack for the traverse of the rakes is increased more than two to one by the wheel underneath being in two parts, one above the other, and of different diameters. The string draws itself out of the jaws when the twisting is completed. The frame is of wrought iron, and is carried at the end by a small caster-wheel; thus the frame runs on three wheels. Price of machine, 60*l.*

The Trials.

Great difficulty was experienced in finding crops suitable for the trials within such easy distance of Bristol as would allow those who had done so much for the success of the Meeting an opportunity of being present. Up to the date of the Show nothing was fixed, and a placard was posted in the Showyard, asking those who had the requisite areas of the necessary crops within a certain radius of Bristol to communicate with the Secretary.

The neighbourhood on all sides is principally in grass. What arable fields exist are small, and inasmuch as the Society required a considerable area of the three cereals, no replies of at all a suitable nature were received, and finally, the Stewards fell back upon an offer which they had originally declined, viz.: to hold the trial on the Abbot's Leigh Estate, at the Hill Farm

of Sir Philip Miles, about a mile from the Suspension-bridge and adjoining Ashton Park. The situation was admirable. This, and the apparent difficulty of finding anything else, induced the Stewards to accept the offer, notwithstanding that the crops were miserably light, unequal, and extremely dirty. I was much surprised to learn that this was a farm of about 500 acres which the late Sir William Miles, whom I remembered as a great agricultural authority, had occupied for many years. There may have been peculiar reasons for its impoverished and neglected condition, but, after seeing it, I was not surprised at a remark which was once made by a shrewd neighbour: "If it were not for Sir William, Farmer Miles would soon be in the County court." The soil of the higher land was thin, on mountain limestone, and full of stones, which were in some cases of rather inconvenient size. It would have been most unfortunate if the trials had been entirely confined to crops manifestly below the average yield of the country, and which, from the shortness of straw and perfect upstanding state, presented no test of the capabilities of the machines to deal with full crops. The grass in the bottom was, on the whole, advantageous, because even on the cleanest farms there are crops with seeds to be cut, and the couch grass was very similar. It would have been so natural for sceptics to say, "Yes, you did fair cutting and tying on crops representing about one half of a fair yield, but how would the machines have behaved in big good corn? We know that in the States the yield is much below us, and the straw is shorter, to start with, and the stubble left higher; no evidence has been afforded that these machines can deal with English crops, and the very point which it was your business to prove you have left undecided." This would have been just criticism; moreover, the Judges could hardly have satisfied themselves with such inefficient tests. It was then extremely fortunate that, on the second day, a piece of oats was found within half a mile of the Hill Farm, estimated to yield 8 quarters, with straw about 5 feet long, and though not lodged yet somewhat disturbed from the perpendicular. It was here that the final and decisive trials were made, and they were of such a character as to confirm previous results, and to leave no shadow of doubt on the minds of the Judges as to the verdict which they would give. The public, who are so deeply interested in this question, as well as the Society and its officials, have cause to feel grateful to Mr. Bishop, the enterprising tenant of Sir Greville Smyth, for coming forward at a moment's notice, and placing his partly cut field at our disposal. Nothing could have been more opportune, and we trust he will enjoy the satisfaction of feeling that his willing compliance, at no doubt considerable personal in-

convenience, with the Steward's request converted into a complete success what must otherwise have been a trial open to grave criticism. Now, the reader may be interested to know how it was that we found eight quarters an acre of oats within half a mile of the miserably deficient crops of the Hill Farm. It was not owing to any improvement of soil, for the land was thin and the stone equally near—indeed a considerable portion of the field was occupied as a stone quarry for lime-burning. Mr. Bishop is the contract scavenger for Bristol, and also a lime-burner. He delivers lime into the city, and brings back manure, which the somewhat hungry soil is grateful for. Last year the oat field was occupied by a capital root crop, which was well mucked, and there remained enough in the land to produce the oats. The lesson here taught might with advantage be taken home by others, for I should judge, from the general appearance of the crops in the neighbourhood, that high farming is the exception. Not only were the crops originally chosen much too light for the purpose, but the date finally fixed for the trials was fully a week too soon, and this, notwithstanding the experience at Aigburth last year. The oats alone were anything like ready, and they might have waited without injury. The wheat and barley were actually green. I believe that the original arrangement was for the 7th and 8th of August, which even would have been too soon; but during the hot weather which followed the Show, the bailiff at the Hill Farm, only recently appointed, and who therefore may be excused for misjudging appearances, wrote urging an earlier fixture, viz., on the 2nd and 3rd, stating that the crops would be dead ripe, and great loss would occur even if left so long.

Finally, the Society, misled where they naturally expected correct information, fixed Monday and Tuesday, 5th and 6th, whereas the proper time would have been the 12th and 13th. In one respect the test of cutting green corn was more severe; the grain was heavier to handle, and it proved the ability of the transporting mechanism to bring the corn to the binding machinery, and also showed the comparative efficiency of the latter to get rid of the sheaves when bound; but, on the other hand, it was impossible to judge as to whether there would be any waste of corn in a fairly ripe crop, and with which machine this would occur. Moreover, as a general principle, it is more satisfactory to place the machines during the trial under the same conditions that they are designed for and will have to work under. The condition of the corn was aggravated by the weather, which was certainly trying. On Saturday and Sunday, the 3rd and 4th, rain fell, and on the latter day there was a regular downpour, which lasted from 10.30 A.M. to 4 o'clock

the next morning. The prospect from that excellent hostelry, the Clifton Down Hotel, on Monday morning was anything but encouraging, for, though not actually raining, heavy clouds obscured the sun, and to the uninitiated it looked more like rain than fine. About 9, however, a break occurred and the sun appeared, and so rapid was the drying action of sun and wind, that by noon the crops were tolerably dry, and the ground, thanks to its light porous nature, was actually able to carry the machines without their clogging. Our Steward, Mr. Sanday, who was indefatigable in his energy and whose excellent arrangements tended not a little to the successful result, had the respective fields measured and lotted out on the Friday and Saturday, chiefly in half-acre plots, so that no time was lost in getting to work when once the conditions were suitable.

It will be remembered that at Liverpool the machines entered for trial were impounded by the Society from the conclusion of the Show until the trials took place. This was felt to be somewhat hard, especially upon novelties, as further improvements were precluded. On this occasion a different policy was pursued. Exhibitors were allowed to remove their machines, on depositing with the Secretary a cheque for 50*l*., to be returned if they fulfilled conditions, but forfeited if they failed to come to the scratch, and with this proviso all the machines shown at Bristol were ordered by the Stewards for trial, whether so entered or not. It is only fair to state that neither Messrs. J. and F. Howard's nor the "Johnston Harvester" Company's machines were entered for trial, and that both firms were somewhat reluctant to exhibit their machines in the field.

When the Judges reached the scene of action, on Monday morning about 11.30, they were disappointed to find that although lots had been drawn for seven machines for a trial in oats only three were actually prepared for work, viz., McCormick's, shown by Waite, Huggins, Burnell, and Co., Mr. W. A. Wood's, and Messrs. Howard's, the representatives of the latter by no means confident of being able to work, as though the binding mechanism appeared efficient, the elevators did not properly bring up the grain. However, they cheerfully complied with our request that they should try, and a piece of ground was found for a preliminary run. The Johnston Harvester Co. people declared their inability to work, for much the same reason; they, like Howard, had adopted what is known in America as the Marsh Harvester as the basis of their invention, and, having had a trial on Saturday, were satisfied that they were not in such a condition of efficiency as to compete. It will be seen that, later on, they were brought out, and the efficiency of the string band and the knot was made evident. Of Hether-

ington's Twister the parts were not completely put together, and we were encouraged to hope that, later on, it would come out, but soon after the work actually commenced we were informed that a worm-wheel had broken, which precluded the possibility of its working. On a suggestion being made by Mr. Sanday, that a telegram should be sent to the works at Manchester for a duplicate, the ingenious representative expressed his regret that, being a Bank holiday, the works were closed. I should be sorry to do him an injustice, but the so-called accident looked very much like a scheme, to get out of the difficulty of having to exhibit a machine which, whatever its merit, and I have already alluded to its great ingenuity, was not capable in its present state of making a successful trial. King was, we heard, on the road with a machine which might arrive on the following morning; and Osborne and Co., who had the same machine they exhibited in the Showyard, and which was identical with that tried last year, were hoping that their new machine, telegraphed for from Paris, would arrive at the same time. Such was the state of affairs at the commencement of the trials, and it must be allowed that it was sufficiently disappointing, after all the expectations that had been formed as to the competition that would take place between our own makers and our American friends.

It is evident that the production of an efficient machine is more difficult than some have supposed; the backwardness of English makers is, after all, only what might be expected when the comparatively short time the subject has engaged their attention is taken into account. As has been already mentioned, Messrs. Howard's machine could not be made to work properly. The corn was not delivered far enough on to the platform, and therefore could not be elevated with sufficient regularity. The reel, not being capable of adjustment, may have had something to do with this, but it struck the Judges that the motion of the elevator was not right. When once the corn reached the binding platform, the tying mechanism appeared to work well. After several attempts, the attendants withdrew from further competition. The McCormick and Wood's machines were the only ones to take up the lots they had drawn; the former having Plot No. 3, more oblong in form, and therefore necessitating fewer turns than Lot 6, drawn by Wood, which was nearly square. The latter was the first to start, a fact that should be noted, inasmuch as the corn was less dry than afterwards. The total time occupied in cutting half an acre was 32½ minutes, of which 4 minutes were consumed in repairing wire, which broke four times. The driver was provided with a rod, shod with iron at the end, with which he dexterously assisted the arrange-

ment of the grain as it fell from the elevator and before the binder-arm descended, thus materially aiding the regularity of placement, notwithstanding which there was quite sufficient litter or scatter to necessitate the use of a horse-rake in order to make a clear finish. Occasionally, the end of the binder-arm caught in the sheaf just made, when assistance was required to liberate it. The green and somewhat damp condition of the straw accounted for this; with ripe dry corn, the sheaf is unfailingly discharged, not only clear of the machinery, but is thrown off some feet, receiving a kick from the back of the arm and additional motion from two springs. The effect of this somewhat violent action on ripe corn is a point we had no opportunity of testing, but there can be no doubt that some loss from shedding must occur. The twister pinion and cutting gear, being contained in the head of the needle, is liable to become choked by portions of grass, &c., and therefore one attendant would be required to follow and wait upon the machine; this, again, would be less apparent in a ripe dry crop. The driver's attention being divided between the travel of the horses and the delivery of the grain to the binder, he has very little power over the former. The sheaves varied somewhat in size, being made according to the discretion of the driver. The binding was excellent, the twist being well secured, and the tension sufficient. Improvements as regards the dimensions of the table and form of divider-board made the cutting and reeling very superior to last year's work; and the adjustability of the reel and the position of the binding mechanism are also noticeable improvements.

McCormick's machine made a start on Plot 3 at 12 h. 47 min., and finished the half-acre at 1 h. 10 min. 45 sec., total time 23 min. 45 sec. No stoppage of any kind occurred, and the gentle, steady action of the binding mechanism—which carries the last-made sheaf at the edge of the platform, until the next gently displaces it, when it drops to the ground, always maintaining a parallel position—was generally admired by the spectators. The sheaves were not so tightly bound as by Wood's, and it will be seen that the breaking-strain, especially on the side of the twists, was not so great. Referring to Mr. Hannam's Report, the reader will be struck with the extraordinary advance that has been made in this machine, due to causes already described; then the great draught was most evident. This is the description:—"The noticeable features in this machine were the strength and the weight of the implement, the great number of shafts, pinions, and wheels, indicating a heavy draught, and the tact with which the clever conductor had striven to reduce this objection in practice by providing a yoke of team-horses of the

most wonderful shape and size." Now the horses were of medium strength, and certainly less powerful than Wood's team. Then the stoppages were frequent, and at last even the strong horses lost their temper and grew restive. Now the driver, instead of being a clever servant, was a young farmer named Pearce, from King's Weston, who, it is said, had never even seen one of these machines before the trials, and he was able to devote his whole attention to driving the team, which he did uncommonly well. Not only was the binding-arm perfectly automatic—that is, doing its work without assistance of any kind—but a sheet-iron shield or cover, above the point where the corn is delivered by the elevator, prevents the driver from even following the traverse of the arm. One man was in attendance, in order to regulate the position of the tying-platform, alter the position of the reel, &c., all which could have been done by the driver with a little more experience of his machine. In this feature of adaptability both McCormick's and Wood's machines are admirably finished, and leave nothing to be desired. These trials on the oats finished the work of the forenoon. After an interval for luncheon, two plots of wheat (a moderate upstanding crop probably 22 to 26 bushels per acre), each containing 1 a. 0 r. 28 p., were set out. Lots were drawn, and the two machines started nearly at the same time. Here McCormick's agents drew No. 1, the upper plot, which was rather the lightest, but equally grassy in the bottom, and the stones were about the same. The conditions were as follows:—

1. Height of cut not to exceed an average of 6 inches.
2. Every attendant except the driver will be noted.
3. Time of cutting will be taken.
4. Number and duration of stoppages will be taken.
5. Quantity of wire used will be taken.

McCormick's machine started at 4 P.M., stopped twice on account of wire breaking, consuming $1\frac{1}{2}$ minute, and finished at $4.50\frac{1}{4}$. Actual time in work $48\frac{3}{4}$ minutes.

The weather having become fine, and it being a Bank Holiday, the attendance was very large, great interest being evidently taken in the proceedings. At first the spectators were pretty evenly divided in their attention to the two machines; but, as the work proceeded, there was a manifest leaning towards McCormick's, and when the last grain was cut the driver received quite an ovation. There was one man in attendance as before. The stubble averaged about $5\frac{1}{2}$ inches, and was very evenly cut. The sheaves were laid with great regularity at intervals of about 15 feet. This is the distance at which the arm works automatically. They cannot be placed nearer, as far as I know;

but the driver can vary the distance according to the crop, and can, of course, hold the corn whilst turning corners, &c. Again, the tidiness of the work was most noticeable. There was less for the gleaners than after hand-shearing with the sickle, and no raking was necessary. This is a matter of importance, not only because labour is saved, but rakings are always less valuable, owing to dirt and stones.

Wood's machine was started two or three minutes after McCormick's. Deducting 6½ minutes' delay from an accident, the knife coming in contact with a stake, the whole time occupied in cutting the plot was 53½ minutes, of which 6·45 were consumed repairing the wire, which broke seven times. Much attention was required at times to relieve the binder-arm from the sheaf. The actual time in work was, it will be seen, 46 min. 45 sec., being just two minutes less than McCormick's. The horses were driven rather fast, and the sheaf was discharged with a considerable kick. The sheaves were made well, but the scatter was again considerable, notwithstanding the exertions of the driver, whose rod was seldom idle. Two attendants were again required in addition to the driver. Fifty sheaves from each plot were selected, and the strength of the wire tested by a spring link.

An adjournment was then made to a barley-field, where the crop was light and short. Here McCormick, who was certainly fortunate throughout, drew a plot more oblong than Wood. The half-acre was cut down without stoppage of any sort in 21½ minutes. Wood's machine did not complete its piece, an accident occurring which rendered it necessary to stop, and the trial was adjourned to the following morning.

During the night there was heavy rain, and, though an earlier start was made, the ground was soft and unfavourable. Wood's breakage, which was a small casting which affected the raising of the platform, having been repaired, a fresh plot of barley was allotted, and a start made at 9.55. Very wisely, as I think, the tactics were altered; the machine was driven much slower, the sheaf was delivered with less force, and the result was much more satisfactory. The wire broke twice only, consuming 2¾ minutes, and the half-acre was finished at 10.30, making a total time of 35 minutes. A smart shower came on in the middle of the trial, which, however, was continued right through it. The straw being short and uneven, considerable litter was made. This appears inevitable from the form and action of the binder-arm, and the way in which the grain is delivered by the elevator. Whilst this trial was going on, McCormick's machine was being prepared for the Dynamometer trials, which consumed the whole of the morning, and were ably and successfully

conducted by Mr. Rich, the Assistant-Engineer, every run being duplicated, so as to insure reliable results. I am justified in saying that on no previous occasion has this important part of the programme been more successfully performed.

Whilst this work was in progress, Osborne and Co., having repaired a breakage which kept them out of the run on Monday, were set to work with the old machine (exactly similar to that worked last year at Aigburth), first in the oats, next in wheat, and lastly in barley. The crops being short and light, no difficulty was experienced in cutting and elevating, and, with occasional assistance, the binder-arm performed its work satisfactorily. Indeed, this very elegant and clever mechanism attracted much attention, and was deservedly admired. The same faults were apparent as last year; there is no sufficient separation between the sheaf made and the inflowing grain, consequently instead of falling to the ground, the sheaves accumulate and hang together like a string of sausages. And as will be seen, when I come to describe the final trials, ordinarily long straw and average English crops cannot be dealt with by this machine in its present form.

The Johnston Harvester Company's machine was, at the request of the Judges, brought out into the wheat, and although, for the reasons explained, it was not able to compete, enough was done to show that the knotting and binding mechanism was efficient as to the result, the band being sufficiently tight and the knot well secured. No opinion is offered as to the durability of the machinery, if brought into regular work. Forty-two sheaves were made without a stoppage of any kind, and only one of these was loose, the string breaking, caused, it was said, by too great tension. No stoppage was necessary, as the end of the string was caught by the jaws, and the next sheaf was properly bound. This appears a very important point; an occasional unbound sheaf is of little importance compared to the delay which occurs from the breakage of wire.

As a further test of the ability of McCormick's machine, a piece of wheat in another field, where the crop was considerably heavier than the trial-plot of the previous day, was selected. I should estimate the crop at 28 to 30 bushels per acre, straw 4 feet long, and the bottom full of grass and quite damp, owing to recent rain. No time was taken. Here again, as in all previous trials, this machine exceeded in its results all expectation; driven with great steadiness and without, apparently, distress to the horses, it cut the plot, supposed to be half an acre, without stoppage of any kind, and the character of the work left nothing to be desired. As this was something like an average crop, the Judges requested that the binding mechanism might be left to work automatically. The result was a fair-sized sheaf, dropped

at intervals of about 15 feet, and left with great regularity. There is a manifest advantage in the automatic gear being so arranged as to suit ordinary crops, the interference of the driver, by means of his foot-leverage, being only necessary when the crop varies in different parts, or is altogether so light that greater intervals are required. Both Wood's and Osborne's machines are equally automatic and controllable, but, unless the crop were extraordinarily heavy, the action is too rapid, and the result would be sheaves too small for practical manipulation.

The work described occupied the morning of Tuesday, and after luncheon, or as soon as the necessary arrangements could be effected, a move was made to Mr. Bishop's field of oats, of which some 6 or 7 acres on somewhat sidling ground was fortunately standing, and when set out formed, as has been stated, a most valuable test of the capability of the machines to deal with average English crops. It was decided to start the machine that first reached the ground, and let the others follow, thus insuring as far as possible to each similar conditions as to crop, &c. The weather was very threatening, heavy banks of thundery-looking clouds appeared likely to discharge their contents, and consequently no unnecessary delay took place. W. A. Wood's machine was the first to charge into the heavy damp corn, and very pluckily the attendants faced the difficulty, and, taking all things into consideration, very successfully was it accomplished. The horses were driven at a moderate pace, consequently, notwithstanding the heavy and damp state of the straw, only two breakages occurred. More than once the canvas of the platform had to be tightened. The attendants, realising their difficulties, seldom took more than half the cut of which the knife was capable, and even with this reduced area they had no easy task to keep the needle-point from clogging, nor were they by any means sorry when the order was given to stop. It should be stated, however, that the first few rounds in the field (being close to hedges on two sides) undoubtedly gave the most troublesome bit of work in the trials, and the Judges were quite aware of the difficulties here encountered, and gave the machine full credit for them.

McCormick got to work about half an hour later, and the superiority of the machine was incontestable.—Taking a full cut, the sheaves were delivered with regularity and without any assistance; as before, there was no scatter, and the work was admirably done. During the second round the knife clogged and the wire broke once. Previous tests were fully confirmed.

Osborne and Co. were last in the field, and first to stop, as it was found impossible to deliver the tangled long grain; and, after a plucky attempt, the machine came to grief and was with-

drawn. The Judges had, despite the unfavourable weather and the unsuitable crops, satisfied themselves and arrived at a unanimous decision, which was made public during the same evening by means of the following Report:—

The Judges appointed by the Royal Agricultural Society of England to try the machines entered to compete for the Gold Medal of the Society, offered for an efficient Sheaf-Binder Machine, are of opinion that the Machine No. 2879, exhibited by Burnell, Waite, Huggins, and Co. (McCormick's Sheaf-Binder), fulfils the conditions of the Society, and they award the Gold Medal to it accordingly. They also highly commend the Sheaf-Binder No. 2853, exhibited by Walter A. Wood.

August 6*th*, 1878. JOHN COLEMAN, HENRY CANTRELL, J. W. KIMBER, } Judges.

Whilst the Judges were occupied in watching the nature of the work, the Engineers and their assistants were busy applying those mechanical tests which are of such importance in aiding a conclusion. It so happened that the superiority of the work done by McCormick's machine fairly distanced competition; but it is easy to imagine that two machines might be so nearly equally efficient, that small differences would have to be considered, and then the results of the dynamometer would be most important.

The first Table (p. 106) relative to the tension of the wire is novel and interesting.

It is quite clear from this Table that the double knot of McCormick's binding reduces its strength, for the breaking strain with the knot up was less than half what it was when the knot was under, and in both positions it is much less strong than either Wood's or Johnston's. Another point of interest that requires to be noticed is the greater strength of the straw binding, a fact that we were hardly prepared for; but there is one point not shown in the Table, which is that, as a rule, the fastenings of the wire resist much more than the twist of the straw. Lastly, it would seem that my estimate of 1*s*. per acre for the wire is much below the mark; indeed, double the money is necessary. As was to be expected, McCormick, although the weight per foot is almost identical, uses most wire per acre, owing to the double twist, yet the difference is too slight to materially affect the cost.

The Dynamometer tests were carried out on a level upstanding crop of wheat, very suitable for the purpose, only it was necessary to run in the same direction as the drills, consequently it was not easy to measure accurately. According to the Table, Mr. W. A. Wood's machine cut more space than any of the

TABLE I.—RESULTS OF DYNAMOMETRICAL TRIALS OF SELF-BINDING REAPING MACHINES AT BRISTOL, 1878.

	C. H. McCORMICK.			W. A. WOOD.			OSBORNE.	JOHNSTON HARVESTER.
	Up Hill Run.	Down Hill Run.	Average.	Up Hill Run.	Down Hill Run.	Average.		
Effective width of knife	..	..	60	..	..	60	..	..
Width of cut*	59	61	60	68·6	64·6	66·6	56·3	60·2
Height of stubble	5·6	5·4	5·5	6·1	6·1	6·1	6·7	5·5
Mean draught in lbs.	379	344	361·5	386	338	362	397	377
Draught in lbs. per inch-width of knife ..	6·31	5·74	6·02	6·43	5·63	6·03		
Draught in lbs. per inch-width of cut*	6·42	5·64	6·02	5·62	5·23	5·42	7	6·26
Number of sheaves cut	39	38	..	36	30	..	Up Hill. Down Hill. 26 23	Up Hill. Down Hill. 25 24
Average weight of sheaves	11·6	11·75	11·67	11·06	15	13·03		
Total weight of sheaves	454	438	..	381	452	..		
Foot-lbs. work per lb. of sheaf-corn cut ..	623	501·5	562·2	716	509	612·5		

* N.B. This was difficult to measure accurately as the runs were nearly parallel to the drills. In future Dynamometer trials the machines should be worked across the drills.

TABLE II.—RESULTS OF EXPERIMENTS ON WIRES AND BANDS OF SELF-BINDING REAPING MACHINES AT BRISTOL, 1878.

	McCORMICK.	W. A. WOOD.	OSBORNE.	JOHNSTON HARVESTER.	Sheaves bound with Straw by hand.
Weight of wire per foot in lbs.	·00306	·00300	·00301		
Calculated diameter of wire	About 21 B. W. G.	About 21 B. W. G.	About 21 B. W. G.		
Breaking Strain with dead weight direct in a single wire	77 lbs.	66 lbs.	76 lbs.		
Breaking Strain on Band of Sheaf. With knot up	41·8 lbs.	101 lbs.	71·2 lbs.	85 lbs.	217 lbs.
Breaking Strain on Band of Sheaf. With knot down	103·6 lbs.	132 lbs.	..	132 lbs.	275 lbs.
Average length of wire used for an 8-inch Sheaf	2·573 feet.	2·552 feet.	2·437 feet.		
Ratio of length of wire wasted to circumference of an 8-inch Sheaf ..	·229	·219	·164		
Total weight of wire used per acre ..	4·724 lbs.	4·594 lbs.	4·411 lbs.		
Cost of wire per acre, at 5*d.* per lb. ..	1*s.* 11½*d.*	1*s.* 11*d.*	1*s.* 10*d.*		

others, exceeding McCormick's by 6½ inches. The lowest and most even stubbles were left by McCormick's, although all the work was creditable in this respect. It will be seen that the mean draught in lbs. per inch-width of cut, which is the real draught-test, was practically identical in the two machines which alone were tried. The average weight of sheaves was in favour of McCormick's; indeed, the difference in the up- and down-hill runs (the incline being very slight) was only ·15, whereas in Wood's down-hill run the weight was increased nearly 4 lbs., being from 11·06 to 15 lbs. On the whole, it will be seen that the results fully confirm the award of the Judges. McCormick's takes the least power for given work. This is shown in the last column. For foot-lbs. work per lb. of sheaf cut we have an average of 562·2, whereas in Wood's this is raised to 612·5. We think, on the whole, the Society may be congratulated on the successful results of their trials. The time is coming, if it has not already arrived, when English farmers must have recourse to labour-saving machinery; and enough has been done to show that practical efficiency has been obtained. In our Colonies, especially Australia and New Zealand, American Sheaf-binders have been largely introduced, and I am informed on credible authority that in certain parts of New Zealand the land has doubled in value in consequence.

Miscellaneous Awards.

The Council of the Society some years ago made a rule as regards the award of Silver Medals, which disqualifies any machine, however worthy and however improved in detail, if it is not entirely novel in principle, or has ever before been shown. No doubt there were good reasons for this strictness at the time when the rule was made, but we cannot avoid the conclusion that it is somewhat hard upon exhibitors, and has a tendency rather to check than encourage improvements. How often it happens that a machine is shown for the first time with features of great merit, yet so defective in certain points, that the Judges do not consider themselves justified in recommending it for award! The exhibitor, educated by the advice he has received, or by the suggestions of his friends, goes home and remodels his invention, and produces a really valuable and practical machine which supplies a want. He is now, we maintain, much more worthy of notice than before; yet he is shut out on account of this rule. Again, it may happen that the Judges themselves have some hesitation in giving their unqualified approbation of an entirely new machine, and would be glad to have the advantage of practical experience. Satisfied on this point, they would gladly

make their award; but the implement has been shown before, and consequently is shut out. When the rule was made, machines were subject to periodical competition, and the exhibitor of a novelty, though ineligible for a Silver Medal, had but to bide his time, and was able, sooner or later, to bring his invention to trial. Now that all this is altered, it is the more necessary that due encouragement should be given to those who are devoting their talents to perfecting agricultural machinery. The Judges therefore hope that this subject will be considered by the Implement Committee; and suggest that Clause 2 of the Society's Regulations be altered, so that a novel principle may be rewarded, whether the same has been shown before or not.

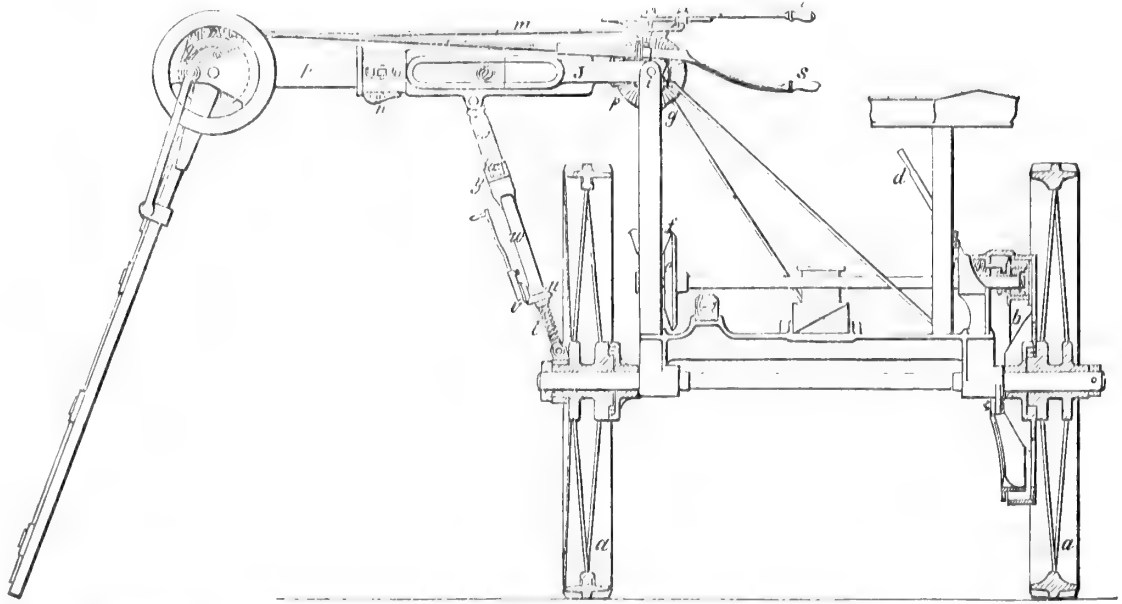
At Bristol there were not many absolute novelties, and of these very few of any practical importance. Improvements in detail were numerous, and some of the more striking will be described and illustrated.

The following were awarded Silver Medals;—3729, Hornsby and Sons, Machine for Cutting and Trimming Hedges. 75, J. Fowler and Co., Church's Circular Steam-valve. 6606, Morris and Griffin, Turton's Permanent Rick Coverings.

No. 3729.—*Hornsby and Sons' Hedge-cutting and trimming Machine* was probably the greatest novelty of the Show. The first patent was taken out by Mr. J. G. A. Walker in 1876, who must therefore be considered the inventor, although Messrs. Hornsby, who purchased his interests, have greatly altered and improved the original design. A second patent, No. 373, was taken out in January of this year. The machine, in its present form, costs 50*l*., and weighs 18 cwt. The following drawings (pp. 110, 111) will fully explain its form. The frame is carried on two travelling-wheels, 4 feet in diameter, fixed about as far apart as a pair of cart-wheels; the tires, 6 inches wide, have a number of projections for securing a bite in wet ground. Both wheels are loose on the axle, with ratchets, so that either is free in backing. In forward motion both wheels are drivers. Keyed on the axis is a gear-ring, *b*, which drives a clutch pinion, *c*, and a lever to the pinion *d* puts the machine in and out of gear. This pinion *c* drives a shaft above and parallel with the axis, which carries on its opposite end a bevel wheel, *e*, driving a vertical spindle carried by an upright frame. A pinion, *g*, on the top of this spindle drives a loose wheel, *h*, working on a horizontal spindle, *i*, lying at right angles to the main axis. On this spindle hinges an extendable telescopic arm, *j*, from the end of which depends the cutting apparatus, or rather from the end of the tube *k*, which slides on the aforesaid arm, and it will be seen by reference to Fig. 15, that by the agency of a lever, *l*, and rod, *m*, the cutters are under the driver's control. The arm *j* can be raised or lowered by a screw; the bottom end of which is supported by the main axle, whilst the top end (also telescopic) is attached to the extendable arm; by this means the cutter can be set to the required height, the range of variation being about 3 feet. Inside the arm *j* is a square telescopic tube driven by the pinion *p* from the loose wheel *h*. This square tube drives a spindle, on the end of which is a wheel, driving the crank pinion and the cutters.

The cutting apparatus is so hinged on the crank-spindle that it can swing round its own axis without affecting the free action of the knife. By a worm and wheel it can be set to cut at any angle, and be folded back over the

Fig. 15.—*Hornsby and Sons' Hedge-cutting and trimming Machine. Back Elevation, partly in Section.*



a. Main road-wheels.
b. Gear-ring keyed on axle.
c. Clutch-pinion, driven by *b*.
d. Hand-lever (in and out of gear).
e. Bevel-wheel, keyed fast on spindle.
f and *g.* Bevel pinions on vertical shaft, driven by *e*.
h. Loose wheel on horizontal pin *i*.
i. Fixed pin, on which outside tube of telescopic arm *j* is hinged.
k. Tube sliding in and out of *j*, which carries cutters.
n n. Friction rollers.
o. Ditto, carried by studs screwed in the tube *k*.
p. Pinion, driven by *h*, and which, through square telescope tube, &c., communicates motion to cutters.
q. Worm-wheel.
r. Worm.
s. Lever-handle for workman's seat.
t. Screw.
u. Nut with teeth cast on.
v. Pinion working on a stud screwed in *w*.
w. Tube containing long screw *t*.
x. Lever.
y. Socket for lever.
w x. Telescope caps.

Fig. 16.—*Plan of Hornsby and Sons' Hedge-cutting and trimming Machine.*

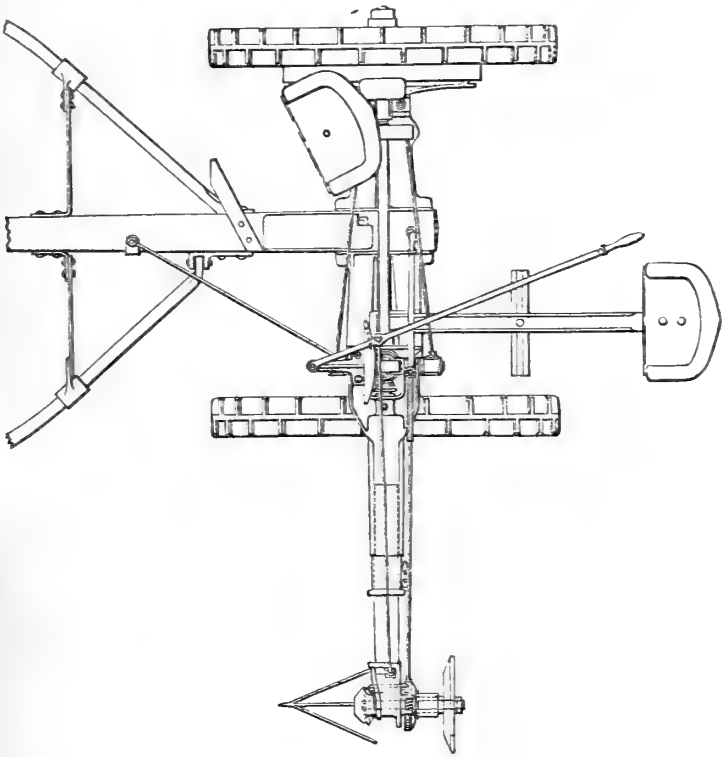
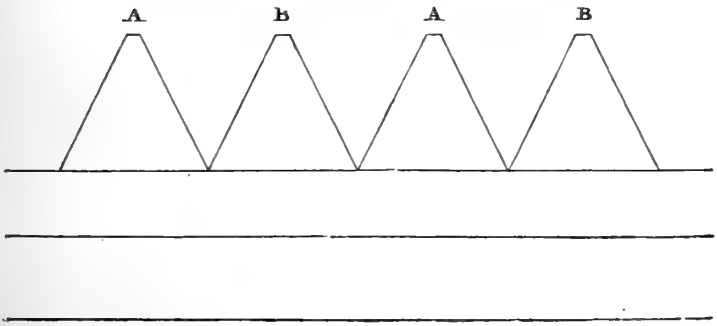


Fig. 17.—*Enlarged View of Cutter.*



frame for travelling. The cutters consist of a set of fixed knives and reciprocating knives, on the double-throw principle (Fig. 17), the knife moving from A to A, thus making four complete cuts to one revolution of the crank. The machine requires a boy to drive the horses and a man to guide the cutters, which he does by means of the lever *s*; thus the cutter can be moved nearer to or farther away from the machine, according to what has to be done, or it can be withdrawn from the hedge altogether, in passing a tree or other obstruction. All this adaptability is obtained by the following simple mechanism:—Made fast to the cutter is a worm-wheel, *q*, in which works a worm, *r*, in connection with the handle *s*.

From the illustrations given, my readers will obtain a correct idea of the mechanism. The *modus operandi* is as follows. The driver, on his seat, places the cutter in the required position against the hedge by operating the worm and worm-wheel at the head of the cutter. The horses are put in motion, being carefully driven, so as to keep the machine a given distance from the hedge. The side of the hedge next the machine is thus cut. The driver, having perfect control over the knives, can extend or withdraw them without stopping the machine. The machine is then brought back to its original starting-point; the cutter-bar is passed over the hedge, and adjusted, so as to cut with corresponding accuracy the opposite side. These two cuts will usually suffice to leave a well-preserved fence in the proper Λ shape, that is, pointed at the top and gradually widening to the base. Should it be desired to cut the top of the fence in a horizontal sense, nothing is easier. The cutter-bar is adjusted in a horizontal position by means of the worm and wheel; then the attendant leaves his seat, and raises the arm by means of the handle of pinion *v*. The wooden lever *x* is then placed in the socket *y*. This lever is so pivoted that the man, by it, can move up or down the telescopic cap *wx*, which fits over the tube *w*, thus moving the cutter to the required height to the top of the hedge.

It will thus be seen that the machine is capable of doing all the work when travelling on one side only. This is of great importance when ditches have to be avoided; also in the case of crops interfering, or boundary fences. A trial was arranged on Monday evening, July 8th, on a wide, badly-trimmed fence of Captain Allcock's, near the Showyard. The fence had vertical sides and a wide top. The cutters were set at such an angle as entailed the cutting through of about a foot of the fence at one part, and wood more than an inch in diameter had to be severed. The ease and precision with which the work was executed was a matter of surprise even to the Judges. This was a most severe test, and it would be difficult to imagine a harder bit of work. After both sides had been trimmed into something more approaching a right shape than it originally possessed, the top was sheared

pretty hard, in order to show the capabilities of the machine for topping. It is quite certain that every time the machine is used on the same fence the work will become easier and the cutting more accurate. The efficiency of the machine to do the work for which it was designed being thus apparent, it remained to ascertain its economy. Mr. J. Hornsby stated that the machine is capable of cutting 5 miles of fences per day of 10 hours. Suppose, for the sake of argument, that we reduce this to 4 miles. The lowest price at which the same could be trimmed by manual labour would be 4*l.*, supposing the price paid was 3*d.* per 22 yards run, which is quite a reasonable rate :—

2 horses, man, and boy, say	£1	0	0
Wear and tear, &c., calculated at 20 per cent. per annum = 10*l.*, spread over 20 days =	0	10	0
	£1	10	0

Thus, then, we have a cost of 1*l.* 10*s.* as against 4*l.*, supposing that such a machine could be employed twenty days in a year. Something might be added for interest of money ; but, making every allowance, it is quite clear that, given a certain amount of work, the saving in money would be quite one-half, whilst the saving in labour and time would be most important. It would require 20 men to cut 4 miles of fence in a day. I was told, on reliable authority, that a Lincolnshire farmer occupying 1000 acres of land, with fields ranging from 20 to 30 acres, has cut all his fences in three days. Such a machine would soon pay for itself, if hired out. Thus, looked at from every point, the hedge-cutting and trimming machine is a practical invention, worthy of the Silver Medal which was awarded. Some doubt has been expressed whether the shears can be kept sufficiently sharp to take off the light twigs which, in a well-shaped hedge, constitute the annual crop. It requires a rapid blow with a slasher to make a clean cut, and it is quite possible that very light wood would not offer sufficient resistance to allow of the shears catching hold. The only remedy for this difficulty, if it exists, would be to leave the hedge uncut for a year, or else to cut rather closer than usual.

In one important respect there is a considerable practical advantage in using this machine instead of manual labour, viz., that the cuttings, instead of being scattered in all directions, drop down close to the hedge, and can be raked up at half the labour.

Church's Circular Steam Valve.—Messrs. J. Fowler and Co., of Leeds, exhibited Church's Patent Slide Valve, a novelty, as applied to locomotive and agricultural traction engines, which, as containing valuable economical features, was considered worthy of a Silver Medal.

This valve is an improvement on one introduced by Mr. Webb on the London and North-Western Railway, and fully described by him in the 'Proceedings' of the Institution of Mechanical Engineers.

The general appearance of the valve will be understood by the following drawings, which have been supplied by Messrs. Fowler themselves. For the description I am indebted to Mr. Anderson.

Fig. 18.—*Cross-Section of Church's Valve.*

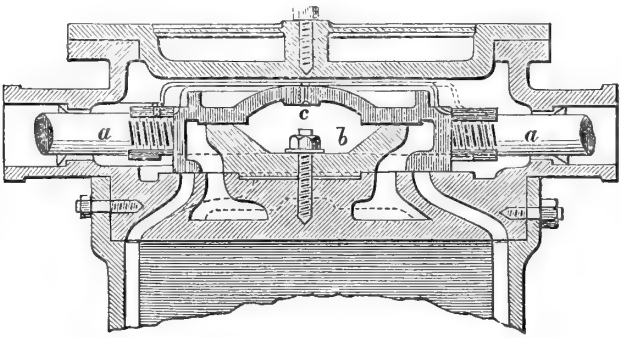
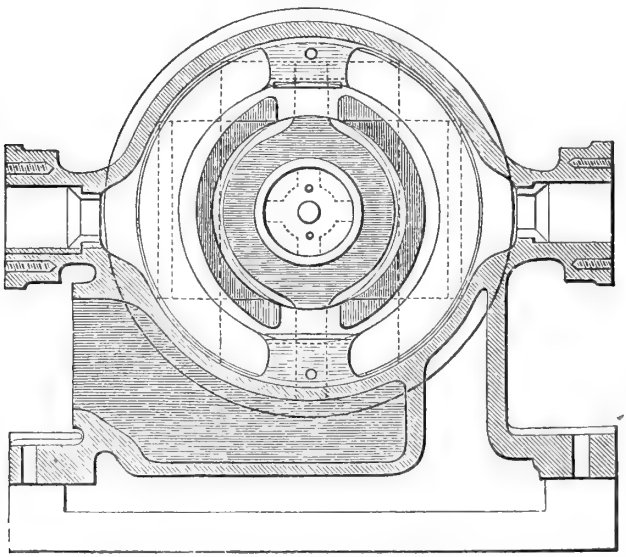


Fig. 19.—*Plan-Section of Church's Valve.*



The valve is circular, in plan like a cheese, and is free to revolve in the bridle *a a*, by which it is moved backwards and forwards like an ordinary slide valve. The ports of the cylinder are segmental, so as to coincide with the circular edges of the valve. The effect of this arrangement is that, if there is the least inequality of friction between the valve and

cylinder faces, the valve revolves a little in the bridle, and by thus yielding prevents abrasion or scoring, and at the same time brings fresh surfaces into contact. The consequence is that wear becomes extremely uniform, and the irregular wear, as in ordinary valves, is entirely prevented, so that not only do the valve and cylinder faces last much longer, but there is also much greater economy of steam. The experience on the London and North-Western Railway quite corroborates Messrs. Fowler's statements.

There is a simple and ingenious method of reducing the pressure on the valve. The valve bears not only on the cylinder face, but also on a kind of cup, *b*, inside the valve,—this cup being connected by means of the hole *c* with the steam space, so that the area of surface represented by the cup is quite relieved of pressure, and consequently the valve is more easily moved and will work longer. It is therefore Mr. Anderson's opinion, on which the Judges entirely based their award, that the introduction of the balanced circular slide valve is a decided gain to the agricultural locomotive, and deserves the recognition of a Silver Medal.

Turton's Patent Rick Covering (*Morris and Griffin*).—The importance of a cheap and efficient substitute for thatch has of late years been felt to be a great desideratum. Straw is now so dear and scarce, that it is positively difficult to get material; then, again, good thatchers are not so common as formerly, and, above all, however carefully arrangements are made, it is often impossible to prevent loss from rainfall before the thatching is done. Dutch barns are undoubtedly the most permanent, and in the end probably the most economical investments; but such are rather landlords' than tenants' work, and it is not every one who can afford the outlay; and therefore a cheap substitute for thatch is highly important. The Judges considered that such was exhibited by Messrs. Morris and Griffin in Turton's Patent Permanent Rick Coverings, in felt, galvanised iron, or plain sheet iron. The invention consists of a series of rafters, *a a*, $4\frac{1}{2}'' \times 1\frac{1}{2}''$ of deal, fixed 3 feet apart, and held in position by iron rods $\frac{7}{16}$ diameter, *b b*, kept tight by cottar pins, *c c c c*. The following sketch, Fig. 21 (p. 116), shows this arrangement. It will be seen that the top and lower distance rods are of different construction, the former, which represent the ridge-board, have space for the end of the two rafters. The appearance of the roof, partly covered by asphalte, is shown in the following drawing, Fig. 20.

The felt or iron is laid on in lengths and held in position by iron pins, Fig. 22, p. 116, about 2 feet long, which pass through the rafters into the rick, metal collars or brass eyelets being fitted into the felt to prevent wear, thus both timber and felt are securely attached on the rick. The advantages claimed for this invention are, (1) that it is watertight; (2) that it is quickly fixed; (3) it is cheap. Without calculating the timber, which will with care last for a number of years, the cost of the felt is not more than that of straw and labour; the best felt can be bought for 6*d.* a yard, and I question whether a good coat of thatch, taking the value of the material into account, can be done at much less, certainly the felt, even if untarred, will last four or five years. It is said that a good-sized rick can be covered by two men in two hours; this, however, is rather a vague statement, and the Judges had no means of testing the question. If all the parts were laid out in order, I see no reason why much time should be occupied, and certainly there would be a great saving over the

Fig. 20.—*Turton's Patent Rick Cover.*

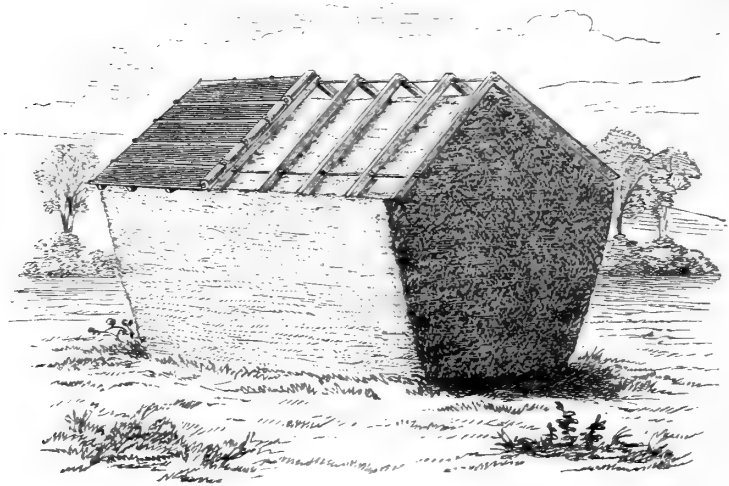


Fig. 21.—*Iron Rods.*

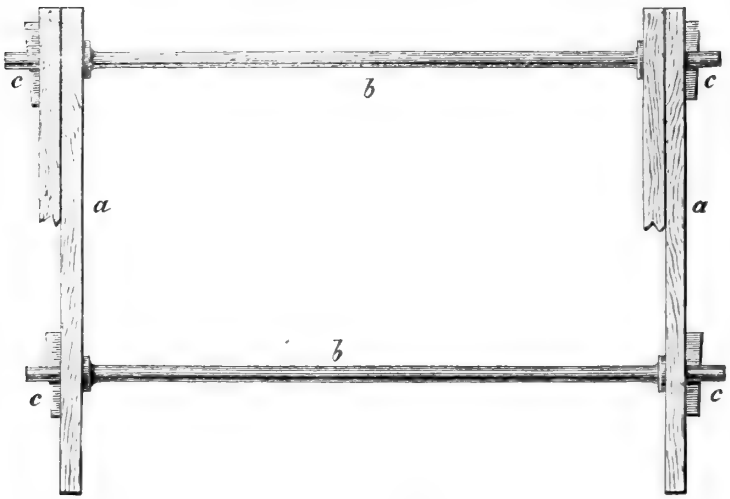


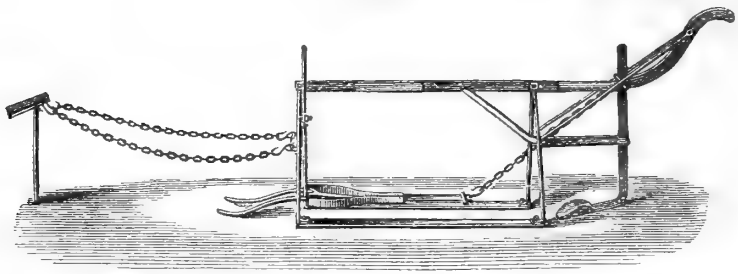
Fig. 22.—*Iron Pin.*

time occupied in thatching. One great feature of merit in this invention is that a certain amount of ventilation is provided for by the depth of the rafters and space beneath the ridge. I am not sure that it would answer so well for hay as for corn, since unequal sinking of the former might interfere with the outline of the covering, but the iron rods would form a considerable support. In felt, the price named, and at which I presume the exhibitors are willing to furnish the material, is 1*s.* 10*d.* a square yard; with galvanised iron, 3*s.* 3*d.*; and with plain sheet iron, 2*s.* 2*d.* a yard. A Silver Medal was awarded.

Although, owing to the restrictions with regard to Silver Medals, the Judges were unable to make any other awards than the three described, many improvements in details deserve mention, of some of these I am enabled to present illustrations, without which, a report on machinery must necessarily be uninteresting and incomplete. In these days of competition and highly paid labour, every attempt to simplify machinery must be regarded as a boon to the agricultural interest, and deserves the fostering care of our great national Society. In this struggle for success much that is worthless naturally is put forward, and it is quite as much the business of the Society to repudiate what is radically bad as to encourage what is really deserving.

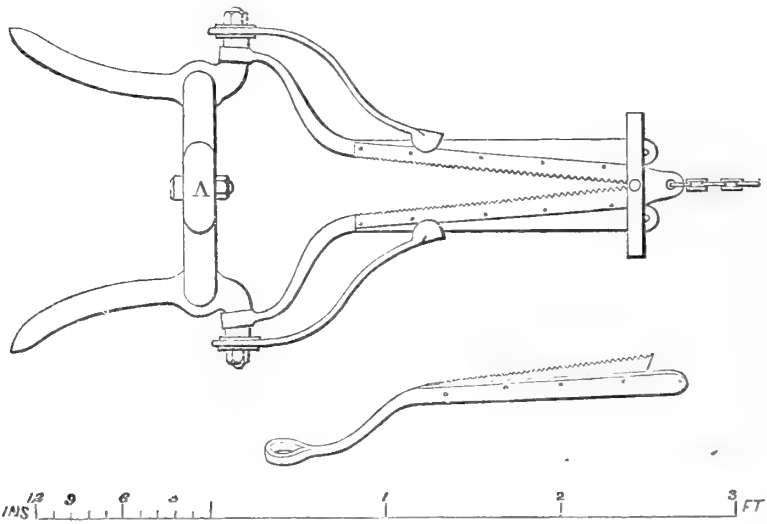
In the Liverpool Report, the Turnip topper and tailer of Thomas Hunter, of Maybole, was described as it then appeared —not sufficiently novel to have a chance of a medal—but still valuable as aiming at economising labour in the important operation of storing the root crop. Very material improvements have been made since last year, and, but for the hard-and-fast line laid down by the Council as to novelty, this invention, had it made a successful trial, would in its present form have been worthy of an award. I cite this as an example of the unsatisfactory working of this rule. Last year the machine was not practical; the driver had not only to drive his horse and steady the implement, but he had to raise or lower the saw frames, according as the roots varied in size; failing this, a tall bulb was cut in two and a short one was not properly topped. It was impossible to give that attention required for such a delicate operation. The machine is made in two forms, according as it is required to deal with one or two rows at a time. In the latter case, the frame is mounted on wheels; in the former (shown in the illustration, Fig. 23, p. 118) it slides on the ground; the horse being so attached that whilst drawing from the side it does not cause undue side-draught. The great im-

Fig. 23.—*Elevation of T. Hunter's Turnip Topping and Tailing Machine.*



provement consists in the form and action of the serrated blades by which the leaves are removed. Formerly, each cutter consisted of one blade placed somewhat diagonally to the line of draught. Now, the cutter comprises two blades placed in a strong spring frame, the open end being towards the crop; as the bulb approaches the closed end, the jaws are partially opened,

Fig. 24.—*Plan of Hunter's Topping and Tailing Machine.*



and the action of the spring, forcing them back, assists in the cutting of the leaves. The saw frames are jointed to the main frame in such a way that they rise and fall according to the size of the roots, and the blades being fastened to the upper face of half-inch guards, the latter ride upon the shoulder of the root, and so prevent the saw cutting too low. It is said that a

single-row machine, with an active horse, will top and tail from 3 to 4 acres a day, effecting a saving in expense of 5*s.* to 6*s.* an acre at least. This, if it works well, is a most practical and important improvement, making the machine almost self-acting. Fig. 24, a plan of the saw frame, and Fig. 25, showing elevation of the slotted standard, through which the saw frames rise and fall, will illustrate the chief features of this improvement.

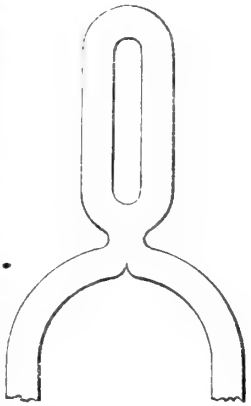
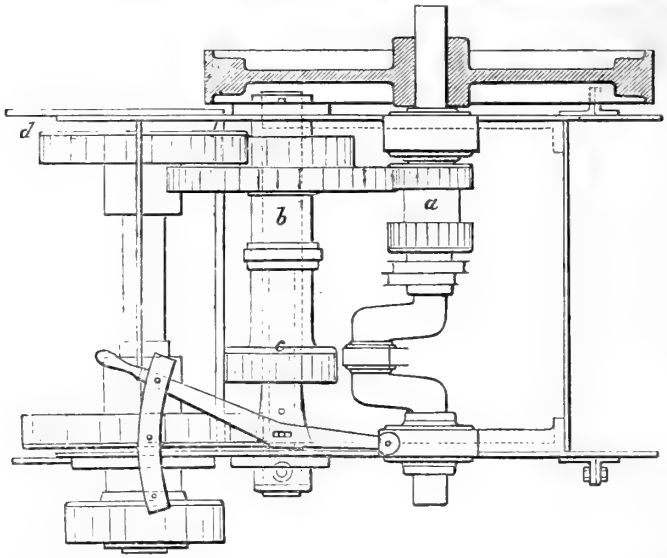


Fig. 25.—*Elevation on A.*

Traction Engines.—Considerable improvements have been recently made in Traction Engines, which tend to increase their practical utility, by stronger construction and increased duty, especially by the use of driving wheels of larger diameter. Both Messrs. Aveling and Porter and Messrs. Fowler and Co. exhibited engines with 7 feet wheels. A short description of the special features in each case will be read with interest.

Messrs. Aveling and Porter's Engine, No. 72 in Catalogue, is described as an 8-horse power, road-locomotive, with Aveling's patent wrought-iron side-plate brackets. The peculiar and novel arrangement of gearing, which has been patented, will be best understood by reference to the plan (Fig. 26, p. 120). From this it will be seen that all the gearing upon the crank-shaft and counter-shaft is contained within the side-plate brackets, by which the width of the engine is lessened by a foot, overhung gear dispensed with, and the fly-wheel brought close to the crank-shaft bearing. The chief object of this invention is to enable road-locomotives, of say 6-horse power and upwards, to be used on railways, the usual gauge of which is less than the gauge required for the road-wheels of engines of such capacity. The two pinions of equal size, marked *a*, are cast together and keyed fast to the crank-shaft, instead of sliding on feathers as formerly. The intermediate shaft, shown on the plan, is fixed, but carries a revolving sleeve, on which are keyed the wheels which transmit the motion to the wheels on the counter-shaft. On the left-hand end are two wheels of different sizes, to give fast or slow motion; on the opposite end is the driving pinion, which is cast on the sleeve. The sleeve can be moved into three positions by a hand lever, and retained in each securely by a strong pin; in this way the driving gear can be made slow or fast, or disconnected altogether. In the illustration, the gearing is shown in its fast speed position; but if the sleeve is shifted to the right, the second pinion

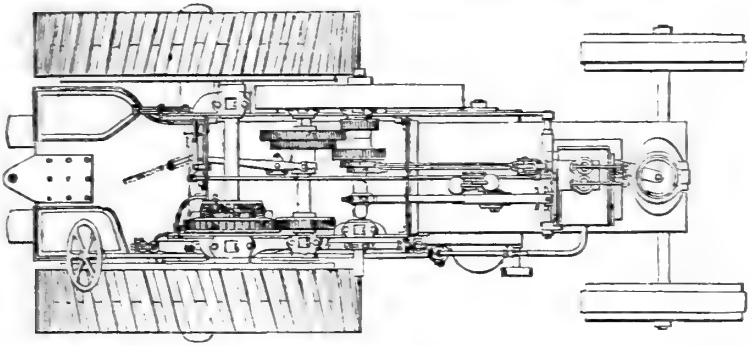
Fig. 26.—*Plan of Messrs. Aveling's Engine.*



on the crank-shaft engages with the pinion on the sleeve, and the other pinion on the right-hand side engages the right-hand pinion on the counter-shaft. The counter-shaft carries a pinion on its right-hand side, and outside the frame, which gears into the open wheel on the main axle of the road-wheels, which also carries the differential gear. On the main axle on the left-hand side, and inside the driving-wheel, is a drum with 100 yards of wire rope coiled in it, which can be used for hauling purposes in case the engine gets into difficulties. When the lever handle is placed in the middle position all the wheels are disengaged. This is a simple and excellent arrangement and a decided improvement. The pinions *a*, *a*, *c*, and *d*, are shrouded, which greatly increases their strength. It should also be noticed that the intermediate shaft, being stationary, acts as a brace to the brackets. The price of the engine is 510*l*.

Messrs. John Fowler and Co., not to be behind their enterprising competitors, exhibited two Traction Engines with commendable improvements. The first of these to be noticed is No. 83 in the Catalogue, which was not very accurately described as a 6-horse power large wheeled traction engine, adapted only for traction purposes, *having no fly-wheel*, inasmuch as the engine which the Judges examined had a fly-wheel. Mr. Anderson has furnished me with the following description, which, with the assistance of the illustration, will, I hope, be understood.

Fig. 27.—*Plan of Messrs. Fowler's Traction Engine.*



The driving-gear of this engine is also inclosed between the frames. On the left-hand side of the crank-shaft are keyed a pair of pinions, which engage with spur-wheels on a second motion-shaft, on which they slide together on a pair of feathers, and can be moved into three positions by a lever, under the driver's control, so as to be in fast or slow speed, or out of gear altogether. The second motion, on its right-hand end and within the frames, carries a pinion which gears into the spur-wheel of the differential gear on a third motion-shaft. The right-hand bevel-wheel of the differential gear has a pinion which is cast solid with it, and which gears overhung into the right-hand driving wheel, while the third motion-shaft on its left-hand end carries the pinion actuating the left-hand driving-wheel. Both driving-wheels have internal annular wheels, about 18 inches less diameter than themselves, and bolted to their peripheries. By this arrangement, which is novel as regards traction engines, the power is transmitted direct to the rim of the road-wheels, instead of passing in the ordinary manner through the spokes. Care is taken, by a deep upper flange on the outside of the wheel as well as by a shield, to keep dirt out of the teeth of the annular wheels. In other respects the engine is of the ordinary type, with the strength and finish for which this firm is justly celebrated.

Another engine of Messrs. Fowler and Co., No. 80 in the Catalogue, is an 8-horse Traction Engine, fitted with a spring between the main driving-wheels, and is thus described by Mr. Anderson. The main axle is square where it passes between the frames through apertures considerably deeper than itself, and in which it is guided laterally, but is free to rise and fall. To the central portions of the axle are riveted a pair of plates, which descend vertically to within a foot of the ground, and carry the centre of a powerful transverse spring, the outer ends of which support the engine on pairs of adjustable swinging links. Round the

fixed brackets, in which the main axle is guided, revolve two drums, one of which serves as a winding drum and the other as a brake; to these are secured the spur-wheels with which the driving-pinions gear the shaft which carries them, having also the differential machinery on it.

The connection between the driving-drum, which also forms the brake, and the road-wheels is as follows:—A loose ring is carried on the inside of each road-wheel by two driving-lugs cast on to it, and held in recesses in the driving-drum in such manner that it is free to move radially in the line of the lugs, as far as the play of the spring requires. By this arrangement the vertical motion of the axle caused by the play of the springs does not in any way interfere with the gearing. Many attempts have been made to place a traction engine on springs; hitherto interference more or less with the gearing has proved the difficulty which Messrs. Fowler and Co. have apparently overcome by this ingenious mechanism. How long the parts subject to friction will last is a question for practical experience. The engine was sent out for trial, made to run over a number of deals, which showed very plainly the action of the springs, and the consequent saving of wear and tear to the engine; next over big stones, and then across the downs over rough land. The steadiness of the body and the compression of the springs were points that could not be gainsaid. According to Mr. Greg's statement, the additional cost of the springs would be about 60*l.*, but no extra price is put upon the engine, which stands as before at 510*l.*

The Savile Street Foundry and Engineering Company, Sheffield, exhibited Hall's improved Bone Mill, No. 5600. The ingenious arrangement for reducing the speed of the rollers by differential gear, combined with an improved friction-break, deserves a short notice. The belt-speed, which is rather high, is thus reduced 20 to 1. In a strong iron frame is mounted a pair of toothed rollers (having separate rings of teeth of wrought iron, machine cut, and case-hardened), geared together by expanding-gear. One roll, by a screw arrangement, is movable, so as to be set closer or wider, according to the materials to be crushed or the results desired. These rollers revolve in bearings, the spindles being hollow. Through one of these spindles, a high-speed shaft with a 4-feet fly-wheel thereon, driven by friction through a break-strap, rotates, having forged or keyed thereon an eccentric, upon which is mounted loosely an external toothed-wheel with 19 teeth, a wrought-iron tail-lever preventing this wheel from turning round. On the spindle of the roller is keyed an internal toothed wheel, having 20 teeth, into which the aforesaid external toothed-wheel gears. The amount of

throw given to the eccentric on the high-speed shaft is such as to cause the pitch lines of the two wheels to coincide at every part of their revolution, and the outer wheel or roller is consequently advanced exactly in proportion to the difference in the number of teeth per revolution, and in the same direction. The great merit of this invention is the reduction of gearing, and consequently of expense and friction. A bracket containing adjustable scrapers is secured against each roller, and a rotatory screening apparatus is attached when required. As a means of further increasing the utility of these mills, chilled rolls can be substituted for the serrated teeth; this is important for grinding coprolites. A small farmer's mill costs 45*l.*

Thomas C. Fawcett, of Burmantoft Foundry, Leeds, exhibited a Plastic brickmaking machine, No. 5648, which deserves notice on account of a very ingenious mechanism for causing an intermittent action to the pug mill. The machine comprises a pug-mill and a cylindrical mould. When the latter has been filled with clay, and its revolution prevents more clay entering, pressure of the clay against the revolving cylinder would be a waste of power, in other words, a loss of force. The object of the peculiar mechanism which the drawings illustrate is to make the action of the pug-mill so intermittent that it only comes into force when the mould or die has done revolving, and presents itself at the mouth of the pug-mill to be filled with clay. This is effected by a friction clutch on the pug-mill shaft.

Fig. 28 (p. 124) shows a cross-section of the driver-wheel in the pug-mill shaft, with the clutch which connects it with the shaft, by the action of the setting-out wedge.

Fig. 29 shows a front section at *a b*, and Fig. 30 the setting-out wedge.

The steel wedge or pin is drawn in and out by means of a cam on the wheel of the crank shaft, in front of the machine, that presses the brick. This cam, through the agency of a connecting-rod, throws the pin in, opening the expansion-levers, and thus starting the pug-shaft, as soon as the mould or die has done revolving, and presents itself to the mouth of the pug-mill to be refilled with clay; then, just as the mould is filled and about to revolve, the cam draws out the wedge and stops the pug mill till the mould has revolved to another opening, and so repeats the operation. The cylindrical mould is pulled round by a small crank and connecting-rod, and a four-toothed ratchet-wheel on the shaft of the mould; this crank being keyed on the top crank-shaft that presses the brick, each time it revolves and presses a brick the mould is pulled round one-fourth or one mould, the cylinder having four moulds. The pulley, or sheave, on the clutch, shown in the drawings, is continually running, being driven by a belt from the first driving-shaft. The clutch is keyed to the pug-mill pinion shaft, so that when the expansion wedge pushes in, the clutch and pulley become, as it were, one solid piece, until the cam on the top shaft draws out the wedge, then the pulley runs loose on the clutch. There is great simplicity and ingenuity in this arrangement, which effects a considerable economy of power. This machine, catalogued at 175*l.*, will probably press and make 8000 bricks a day.

Fig. 28.—*Cross-Section of the Driving-wheel of Fawcett's Brick Mill, No.* 5648.

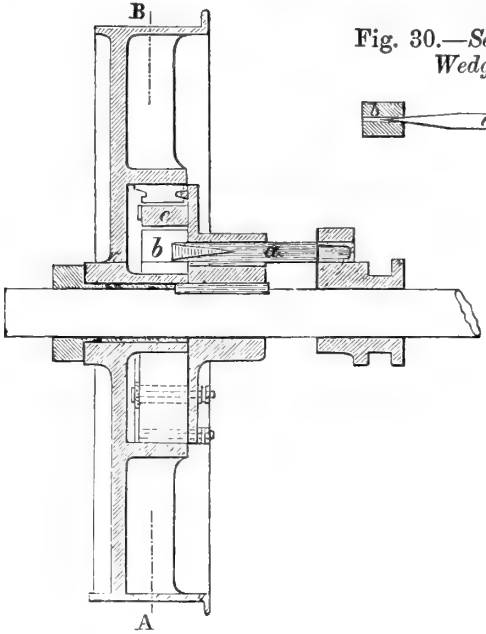
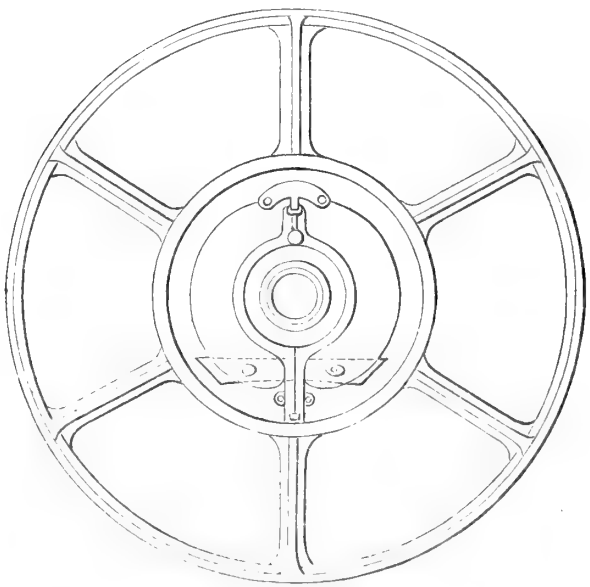


Fig. 30.—*Setting-out Wedge.*

Fig. 29.—*Section at* A, B.



James Smyth and Sons, Peasenhall, Essex, have made important improvements in their Corn Drill, which may be shortly described. The object in view has been (1) to obviate the necessity of removing the seed-cups or hoppers in the seed-box, and thus to facilitate the removal of the spindle, as well as avoid the breakages which sometimes occur in consequence of the imperfect refixing of the hoppers; (2) to provide such a change of gear, without alteration of wheels, as will compensate for difference of pace caused by travelling up instead of down hill, or the reverse.

Fig. 31.—*Elevation of Seed-box of Smyth's Drill.*

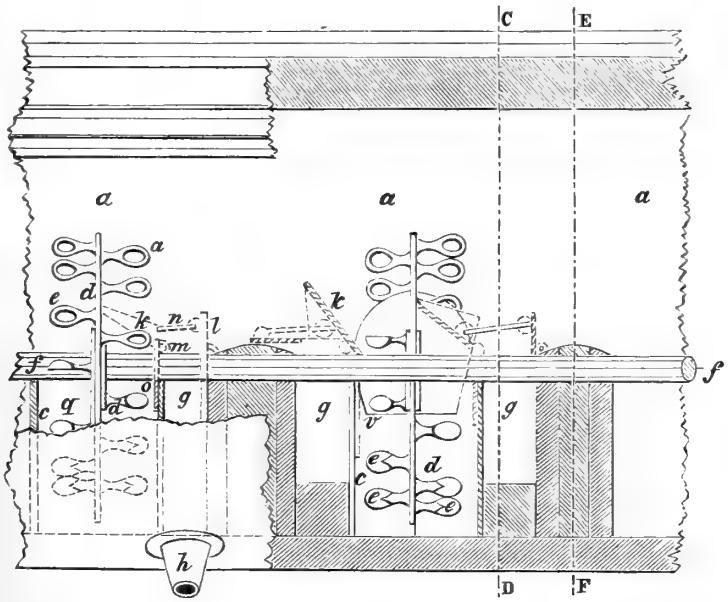


Fig. 31 is an elevation of the seed-box, with its cup-barrel and wooden hoppers.

a is the upper chamber of the seed-box.

d d, the discs which carry the cups *e e*.

f f, the cup-wheel spindle.

g g, the receiving hoppers through which the seed passes to the conductor, *h*, attached to the underside of the seed-box.

The forward part of the hopper extends upwards to the level of the top of the cup-wheel spindle, and the rear part up to the level of the under side of the said spindle.

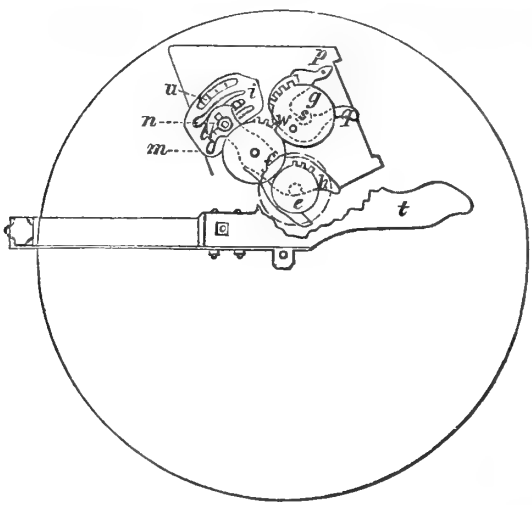
k l are two plates attached to the rear of the hopper by the joints *m m*. The plate *k* inclines towards the cup-wheel *d d*, so that the seeds fall upon it and descend to the hopper *g*.

n is a link which couples the plate *k* to the plate *l*, and retains *k* at its proper inclination, the plate, *l*, resting at its lower extremity against the side of the hopper.

The side of the hopper next to the cup-wheel carries a plate, *o*, which turns on a pivot, *p*; this plate serves the purpose of covering the space between the top of the hopper (in rear of spindle *f*) and the lower edge of the plate *k*.

When taking out the cup-barrel with its spindle, or when it is desired to shut off the seed for reaching any of the conductors, the plate *l* is brought into a horizontal position and this pulls the plate *k* away from the cup-wheel, causing it effectually to close the top of the hopper *m*, and allows free exit to the cup-wheel and spindle.

Fig. 32.—*Mechanism of Smyth's Drill for regulating Hill-side Delivery.*



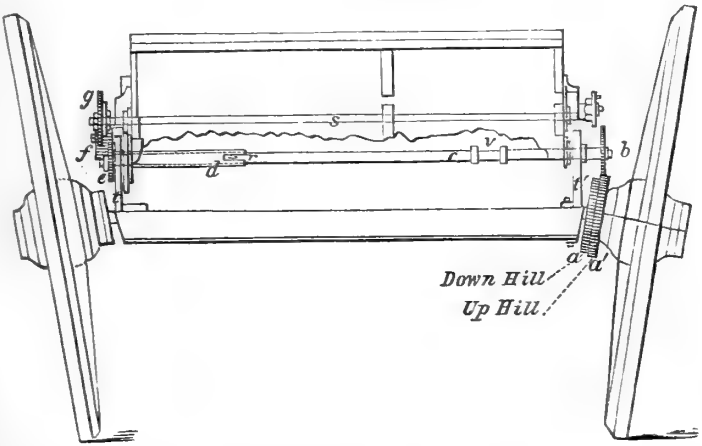
The following particulars explain the Figs. 32 and 33, and illustrate the mechanism for regulating hill-side delivery:—

a, cog-wheel on nave of carriage-wheel (22 cogs).
a', ditto ditto (24 cogs).
b, cog-wheel on end of counter-shaft *c* (16 cogs).
d, Hollow spindle into which *c* slides end ways.
e, cog-wheel (14 cogs) secured on end of hollow spindle *d*.
f, intermediate cog-wheel, which communicates motion from *e* to *g*.
g, cog-wheel attached on end of cup-wheel spindle.
i, radius plate to which the radius arm *h* is secured and adjusted, so as to bring the intermediate wheel *f* correctly into gear with the various sized change wheels which are applied to the cup-wheel spindle *s*.
k, bolt by which radiating-arm is secured to radius-plate (this bolt fitting into the grooves *m* and *n*.
p, catch for retaining support-plate in position.

q, support-plate, which carries the brass bearings in which the cup-wheel spindle revolves.

This support-plate turns on a fixed pin, *w*, and, by raising the catch *p*, the plate and bearings fall away from the cup-wheel spindle, leaving the spindle free to come out of the seed-box *u*; *r*, stud fixed in counter-shaft *c*, to drive the hollow spindle *d*.

Fig. 33.—*Smyth's Drill.*



s, cup-wheel spindle, supported at each end of the box in bearings affixed to the plate *q*.

t, iron side-plates which carry the seed-box (*c*, Fig. 31); the point of support is shown cut away, in order to show the gearing arrangements.

u, seed-box.

v, recess in shaft *c*, to receive a forked lever for sliding the shaft endways, in order to bring the cog-wheel *b* into gear with the nave-wheels *a* or *a'*, as may be required. A larger cog-wheel can be placed on the hollow spindle *d*, in place of *e*; but when this is attached, the bolt *k* is moved into the groove *n*, in order that the intermediate wheel *f* may gear properly in *e*.

The above explanations of Figs. 32 and 33 will enable the reader to understand the very simple mechanism by which an alteration of speed is provided for the cup-spindle, according as the drill is travelling up or down hill. For want of this arrangement we frequently find great irregularity of seeding, and a reference to the Report of the Drill-trials at the Centennial Exhibition will show that, even in the best force-feed drills, when on the hill-side and level, the regularity was almost perfect; serious differences of discharge were noticeable up and down hill.

At the Paris Exhibition, trials of drills were carried out at

Petit Bourg on July 29th. The drill which I have endeavoured to describe gave the following results :—

The produce of the two outside rows (Nos. 1 and 10) weighed 258½ grammes.

The produce of the two middle rows (Nos. 5 and 6) weighed 264 grammes.

Total of ten rows, 2565 grammes.

Average per row, 256 grammes.

In last year's Report, Otto's Gas Engine was described at some length. For some reason—probably as not being strictly an agricultural implement—no medal was awarded, although the invention was deservedly eulogised as a great advance upon previous attempts in this direction. At Bristol, Crossley Brothers, who manufacture these engines, exhibited a machine with 14·1 indicated horse power. This is another advance. Hitherto gas has been considered suitable only for small powers. Mr. Anderson has furnished me with the following report upon the three gas engines exhibited at Bristol :—

Crossley Brothers (5549 to 5552) showed the "Otto Silent Gas Engine," in which a mixture of gas and air is exploded at one end of an ordinary steam-engine cylinder, at every alternate revolution. The explosive mixture is fired by means of a small permanent gas jet. The gas is admitted by a slide-valve working across the rear-end of the cylinder : the exhaust is actuated by a cam motion, and the governor regulates the admission of gas. A large number of these engines are now in successful operation, and they have attained to a considerable size. No. 5552, rated as 8-horse power, has a 9-inch cylinder and a 16-inch stroke, running at 160 revolutions per minute. The indicator-diagram, taken in the yard, gave a maximum pressure at the moment of explosion of 162 lbs. per square inch, a mean pressure of 69½ lbs., and consequently 14·1 indicated horse power.

Messrs. Thompson, Sterne and Co., of the Crown Works, Glasgow, exhibited No. 5858, a hydrocarbon engine, which depends for its action on the expansion produced in compressed air by the combustion of petroleum. It consists of an air-pump, an oil-pump, and a working cylinder. The air-pump compresses air into a receiver, whence it is admitted into one end of the cylinder at the same time that the oil-pump injects a sufficiency of oil to develop the greatest pressure without causing the smoke due to imperfect combustion. The distribution of the oil and air is managed by tappet valves, and ignition is effected by a permanent flame in the inlet orifice. The whole apparatus, though at first sight complicated, is not really so, and is arranged in a very compact and accessible form. The advantage of using oil instead of gas is very considerable, as it enables the engine to be used when gas cannot be obtained, and in this respect commends itself as a useful source of power for the farm and dairy. It works under 80 lbs. pressure, and is said to consume a little less than ¼ of a gallon of oil per horse-power per hour. The engine shown at Bristol was of 5-horse power, measured on the break. Its price was 100*l.* at Glasgow.

The greatest novelty in this direction was shown by *Messrs. Louis Simon and Son*, of Nottingham, in Article 5919, the "Patent Eclipse Gas Engine," which has some features in common with the hydrocarbon engine. Com-

pressed air, heated by combustion, is here also the source of power; but instead of petroleum, gas is used. The gas is drawn into the air-pump with the air, and the mixture is compressed together, and in this state admitted into the working cylinder, where it is fired by a permanent flame, burning in the inlet orifice. In this engine the heat of combustion is not wasted, but serves in the first instance to heat a water-jacket round the cylinder, through which the water is pumped into a small field tubular-boiler, where it is converted into steam by the heat of the exhausted gases, and the steam so generated is admitted into the working cylinder, and mixes then with the gas. This admixture of steam, besides conducing very materially to economy of working, is said to increase the durability of the working parts, and render very little lubrication necessary. The various valves are actuated by cam motions, and, like the hydrocarbon engine, the mechanism appears complicated, though it really is not so.

Amongst the novelties of the Bristol Meeting was a tipping waggon, shown by Frank P. Milford, of Kenn, Exeter, constructed to carry 6 tons. The material and workmanship are highly creditable. The bed-framing of the body and also the bottom-boards are of oak, the sides and shelvings (the latter over the wheels) consist of 1½-inch elm planks, well stayed with iron, and firmly bolted together. Capacity, 11 ft. 6 in by 4 ft. 4 in. by 1 ft. 5 in. clear of the body; shelvings, 11 in. wide each side; area of curved ladders 18 ft. 6 in. wide, by 3 ft. deep. The object of this construction is to enable the waggon to carry a large quantity of corn, hay, or straw, without the necessity for ropes, as the farther the load is carried the tighter it gets. The tipping apparatus consists of an oak framing, fitted between the framing of the bed; consequently, no additional height of body is required. The front and back body pillars are bolted and fitted to the tip-frame, the front pillars taking the front carriage at the main pin (the pin from which the carriage locks under) and the hind pillar taking the hind axle and case. The framing is so strongly made that it is impossible for it to shift or get out of place.

In the front part of the bottom of the waggon, and directly behind the front carriage, is a hole 12 in. by 24 in., through which the front part of the load empties itself. This hole is covered by a hinged door, which is held up by a pin; when this is knocked away, it follows that the fore part of the load is discharged, and the weight of the tail causes the waggon to tip and discharge the rest of the load. The horses are moved on, and the body gradually resumes its proper place. This is a clever arrangement, very suitable for the discharge of coals, lime, stone, or even roots. The tailboard is hinged, and when thrown back is held up by a spring so as to be out of the way. The hind-wheels are placed well forward, which materially aids the tipping. A trial was made with a load of coals, which were discharged in a few minutes—certainly in much less time than if they had

been shovelled out. The Judges were much pleased with this invention.

Mr. J. H. Knight's Patent Digging Machine by steam-power for Hop-grounds, exhibited, I believe, for the first time, excited considerable attention: driven by an 8-horse power engine, it was stated by the inventor that this machine will dig from 3 to 5 acres a day, at a depth of from 8 to 12 inches, and I hear from hop-growers that it has done very good work. The machine comprises a frame or carriage on four wheels. The front-wheels, which are comparatively small and close together, are for steering. The hind-wheels, which carry the greater part of the weight, are used for propelling. On the upper part of the frame and a little behind the driving-wheels, a crank-shaft of three throws is fitted, which works three vertical connecting-rods, into the lower end of which, guided by radius-rods or guides, are fitted the tines which penetrate the earth, turning it up and over. One end of the crank-shaft carries a bevel wheel which gears into a pinion on the driving shaft; on the other end of the shaft is a grooved pulley, driven by a high-speed hemp rope, which communicates motion from the engine to the machine. A train of wheels communicates motion from the crank-shaft to the driving-wheels. The engine may be placed in any corner of the field, pulleys attached to ordinary farm waggons being used as movable anchors on each headland.

The cost of the machine, including two sets of tines, rope, 3 corner porters, 4 working rope-porters, 14 post-porters, tension carriage, pulleys to attach to waggons, pulley blocks, anchor-bars, tools, &c., is 230*l.* Mr. Knight calculates the daily cost of working, including allowance for interest and wear and tear, at 2*l.* 12*s.*, for which four acres can be dug, thus giving a total cost of 13*s.* an acre, against an average of 25*s.* for hand labour. The work has been very favourably reported upon in some of the leading agricultural papers. The 'Agricultural Gazette' of Nov. 6th, 1876, thus describes actual work, which unfortunately the Judges had not the opportunity of seeing: "When the machine is in motion, these forks or spuds are forced into the soil evenly and regularly, being guided uniformly by the guide-rods, taking spits or furrows of about 5 inches wide, lifting the earth, and throwing it not exactly over perhaps with perfect accuracy, but moving it, disintegrating it far more than hand-digging could, and fairly burying the weeds and manure." As it is in contemplation to offer prizes for steam-cultivating machinery in 1880, it is probable that this machine will receive a thorough trial. In setting the apparatus to work the hemp rope is led round the field from the engine on pulleys and porters, taking a turn round the driving pulley on the machine;

when the digger has made a journey up the field and arrives at the headland, the tines are lifted out of the ground by the hand-wheel and screw, which forces backward the lever, on which the forward ends of the radius rods are hung. As it is forced back, the tines are raised out of the ground; the land-side wheel is then released from its axle by the clutch, and remains stationary, while the machine is turned round by the other wheel. The machine is worked by three men and a boy. It is made by Messrs. J. and F. Howard of Bedford.

In connection with steam-cultivating machinery may be noticed an improved Cultivator, shown by Messrs. Barford and Perkins of Peterborough, which has been still further simplified since the Meeting. The novelty consists in an arrangement by which the tines of the cultivator can be lifted out of the ground, or set shallower or deeper at any point of traverse, as well as at the land's end, by the action of the steersman; the travelling-wheels are attached to a crank-axle in the ordinary way. The lifting power is attained by two scoop-shaped double-ended pawls on a crossbar on the top of the frame, and two notched wheels bolted to the bosses of the travelling-wheels. When these pawls are depressed, which is easily done by foot-leverage, the notches and pawls are brought together, when they lift the frame and tines clear of the ground. A pawl dropping in a catch holds them in position. When it is required to put the cultivator into work, the pawl is pulled out of the top catch, and dropped into some of the other catches on the quadrant, according to the depth required. This is a simple and efficient arrangement. Good steering power is secured by having a sliding draw-bar, looped on a crossbar, thus the draw-bar can adjust itself to the line of draught. Side thrust is thus removed, and the implement can be steered out of the line of the pulling rope. Two sizes were shown—a 7-tined costing 50*l.*, and a 5-tined, price 35*l.*

I cannot conclude this Report without expressing my acknowledgments to the Society's engineer, Mr. Anderson, for the great assistance rendered me by his examinations and reports on several of the machines which are therein described.

VII.—*Report on the Trial of Dairy Implements and Machinery at Bristol.* By Gilbert Murray, of Elvaston, Derby.

Introduction.

The growing importance of the dairy interest of these islands is inducing a great desire for information likely to elucidate any of the various processes in the manufacture of butter and cheese, and to guide to new and improved practices. Since the introduction of the factory system of cheesemaking into England in 1869, the Council of the Royal Agricultural Society have, at considerable cost, obtained and published a large amount of information descriptive of the different systems which exist in Great Britain, as well as in other countries. Before entering into a detailed account of the trials of the dairy utensils exhibited at Bristol, I must briefly sketch the growing importance of the dairy interest.

Within the last twenty years vast improvements have taken place in dairy management; the introduction of the Cheddar system of cheesemaking into the great dairy counties of the south-west of Scotland produced a revolution in that district. The new system, where intelligently carried out, enhanced the prices obtained by cheesemakers from 25 to 30 per cent., and, in the case of first-rate makers, even more. But, like every innovation on established customs, the new system met with considerable opposition, and its principle was warmly discussed; a spirit of rivalry sprang up, and was fanned through the publicity of the press, hence the rapid development and perfecting of the system, which has long since surpassed the old Dunlop method. The introduction of the factory system of cheesemaking from America nine years ago, the passing of the Adulteration of Foods Act, and the fatality of the contagious diseases with which the urban cowsheds have recently been infested, have each contributed in no small degree to the extension of dairy farming in the rural districts. The promoters of the factory system, in dealing with the raw material on a large scale, elicited and conveyed to the public a large amount of practical information, hitherto unattainable in this country. Previously, many who had been engaged in cheesemaking from childhood had hazy ideas as to the quantity of milk requisite to produce a pound of dry curd, or of the percentage of shrinkage entailed in curing the cheese.

The protection afforded to the consumer by the provisions of the Adulteration of Foods Act has immensely increased the consumption of milk in its natural unprepared state. So recently as ten years ago, except in the case of a few small farmers located round the suburbs of the large towns, there was no established

new-milk trade from the country to the towns; although in the large manufacturing centres of the northern counties, where a considerable percentage of the working classes are of Celtic origin, buttermilk had long been in demand, and until a short time ago was the only milk sent by rail.

Ten years ago the Midland Railway had no milk traffic; now special milk-vans are attached to the morning and evening trains running from Derby to St. Pancras. Between 7 and 8 o'clock in the morning fifty milk-carts may be seen at Derby Station; only a few days ago I counted 200 milk-cans on the platform, whilst intermediate stations, between Derby and Leicester, contribute their quota to swell the aggregate. Not only to London, but also to Birmingham, Manchester, Sheffield, Nottingham, and even to Middlesborough-on-Tees, does Derbyshire furnish supplies. Manchester also draws large quantities of milk from Cheshire and Lancashire; and many of the Manchester innkeepers are now first-rate customers. Milk at the present time forms no inconsiderable addition to the traffic on every line of railway having a terminus in the metropolis. It is estimated that from 100,000 to 120,000 gallons of milk is daily consumed in the metropolis; taking the larger quantity, this gives a fraction over a quarter of a pint per diem for each of the four millions of human beings living in London and its suburbs. This being so, the question naturally arises, Does the trade admit of greater expansion? Those best qualified to form correct opinions on the subject maintain that, at least for the present, consumption has nearly reached its limits. Yet the public require, so to speak, a sort of probationary education in order to dispel popular prejudice, and it is only by slow degrees that the current of established habits can be diverted into a new course. Milk is the only true natural food we possess; it contains all the elements of nutrition in an easily assimilative form. Considered from an economical point of view, milk is relatively as cheap an article of food at 5*d.* per imperial quart, as beef at 8*d.* per lb., with the further advantage that the former will sustain life for a lengthened period, whilst the latter is incapable of doing so for any considerable time.

Professor Johnstone had clear ideas as to the comparative value of milk when he published his 'Elements of Agricultural Chemistry and Geology,' more than half a century ago. He remarked, "if a vigorous economy of food ever becomes a national question, a milk diet will then become the daily subsistence of all classes." Although the literal fulfilment of the Professor's prophecy is still distant, milk, either in a raw or manufactured state, has now become a necessary adjunct to the bill of fare of every household, where, a few years ago, it was only introduced

as an expensive luxury. Various methods are now adopted for preserving milk. In a condensed form it retains all its original properties unimpaired for a long period, and is said to be capable of withstanding every vicissitude of climate. When condensed, it is stored in hermetically sealed tins, and by adding about four times its bulk of water, it forms a good substitute for new milk when that is not procurable.

So far I have looked at the subject entirely from a consumer's point of view; now I turn to the interests of the producer.

It is generally admitted that more progress has been made during the last ten years than during the previous three-quarters of a century. Virtually the same systems of treating dairy-cattle had been in operation for ages, and had been handed down from sire to son, and mother to daughter, unimpaired and unimproved. The cows were turned out into the pasture-fields, during the daytime, even in the severest weather, to crouch and shiver under the temporary shelter of some hedge or tree; whilst in the sheds their chief food throughout the long and dreary months of winter was hay, frequently of poor quality, and invariably in an unprepared state, with the exception of an occasional load of brewers' grains. No artificial food of any kind was ever used; the young stock were confined to the same meagre fare, hence they were stunted in their growth, and late in arriving at maturity, the heifers never coming to the pail until three years old and upwards. Very little attention was bestowed on the selection of bulls of a superior type or quality, their chief merit was the capability of reproduction. Happily those ancient notions have been dispelled, and the dairy farmer has now become fully alive to his own interests. There are few farmers who milk 20 cows and upwards who do not use a bull with two or three pure crosses of blood; the young stock are better reared and better kept, and bring their first calf at twenty-four to twenty-eight months old. This not only saves eight months' or a year's keep, but it is generally admitted that two-year-olds milk better than three-year-old heifers, if they are well kept. The factory system and the milk trade have taught the dairy farmer a valuable lesson, by bringing more forcibly under his notice the exact yield of milk which his cows daily produce; hence the utility of selection is forced upon the farmers, and all inferior milkers are drafted out. Some persons, with only a superficial knowledge of the subject, raise an objection to milk-selling, on the ground that it injuriously affects the interests of the landlords by exhausting the manurial condition of the land. On the contrary, my experience of milk-selling for the last five years on large estates, both in Derbyshire and in Cheshire, has fully convinced me of the beneficial results which

the system has already produced on the manurial condition of the land. I can point to numerous cases where the sum expended yearly on purchased food has recently been equal to, and has sometimes exceeded, the rent of the land, and this on farms where, previous to the sale of milk, no artificial food was ever purchased. As an illustration, I may mention, amongst others, the case of a farm of 132 imperial acres in East Cheshire, of which 35 acres are tillage and 97 acres are old pasture; about one sheep to 2 acres has always been wintered on the grass-land; six or eight cow-calves were reared each year to keep up the stock. Ten years ago, 21 cows were considered a full stock, for the last two years 40 cows have been kept, exactly the same acreage being under tillage. The number of calves reared yearly is now 12. The farm is within two miles of a railway station, and within twenty miles of Manchester, where the milk is sent; nearly the same quantity of milk is produced in the winter as in the summer months. To keep up this supply the cows must calve at different periods throughout the year: they are highly fed; during the winter large quantities of Indian meal and grains are used.* Some of the older cows and the light milkers are drafted out to the butcher before they are quite dry, and replaced by others, either recently calved or at the point of calving. The tenant has erected a fixed steam-engine which drives a grinding-mill, chaff-cutter, root-pulper, and other machinery. Nearly all the farm has been boned; independently of this, there can be no question as to the benefit the land is deriving from such a system of management. Had there been no other method of disposing of the milk except by converting it into cheese, it is highly probable that the farmer would have had little money to spend on the purchase of artificial food for his stock. In point of progressive improvement, dairy farms contrast favourably with those principally under tillage, where the results of a cycle of unfavourable seasons, occurring at a time when the farmer has been beset by the difficulties of the labour question, has resulted in leaving the generality of tillage farms both in a lower manurial condition and in a worse state of cultivation than previously, and the tenant a poorer man also. On the stronger description of undrained tillage lands, landlords have had considerable difficulty

* Indian meal and grains do not make the best food for milk-cows. The addition of decorticated cotton-cake to Indian meal has proved in practice very useful as a food for milking-cows; which is intelligible enough, if it be borne in mind that Indian meal is comparatively poor in nitrogenous constituents, in which decorticated cotton-cake abounds, and that for the production of the caseine or curd in milk, food is used which, like decorticated cotton-cake, contains nitrogenous compounds analogous to caseine in considerable proportions. The supply of decorticated cotton-cake to milk-cows at the same time materially increases the value of the dung of cows fed upon this description of food.—A. V.

in letting arable farms, whilst they have experienced no difficulty in letting dairy farms, particularly when situated near a railway. The principal obstacle which at present impedes the progress of improved dairy husbandry is the want of adequate buildings. Throughout the whole of the dairy districts good buildings are the exception: evidently, as a rule, but little thought has been bestowed, either to secure the health and comfort of the animals themselves, the economy of labour, or the general convenience of the farmer. The entire system has so rapidly and completely changed that on most farms, even where the buildings are substantial, they require an entire rearrangement, and additional buildings are necessary for the preparation and the mixing of food.

There are already indications of the soiling system being adopted by dairy farmers, provided covered yards could be obtained. Wood and iron might be more generally and economically employed in the erection of farm buildings, particularly covered yards; by this means more extended accommodation could be furnished at considerably less cost than heretofore. The universal importance of the subject at the present moment must be my apology for having so far digressed from the subject of this Report.

The Trials.

The Judges entered on their duties on Monday, the 8th of July, and spent the greater part of the day in inspecting the stands of the numerous exhibitors and selecting the various implements for trial. 1200 gallons of milk and 200 gallons of cream were used in the trials. I shall now in this description follow the printed instructions to the Judges.

Class I.—Milk-Cans suitable for conveying Milk long Distances.

Of the leading points of a good milk-can, the first is facility of cleaning. This is of the utmost importance, particularly to the farmer who has to depend entirely on hand labour. In large establishments, where steam can be used, the work of cleansing can be more easily and effectually accomplished. In no case should there be any projections or angular depressions inside; imperfect cleansing is the greatest source of loss and annoyance, both to seller and purchaser; facility of filling, freedom from spilling, means of preventing motion whilst in transit, are all points of minor importance. There were 15 cans shown by 8 different exhibitors; these varied in capacity from 9 to 40 imperial gallons, and in price from 1*l.* 10*s.* to 4*l.* 15*s.*

The most practicable and easily handled size is that in general use in the London trade. These are all of uniform capacity, and hold 8 barn or 17 imperial gallons, and weigh, when full, $1\frac{3}{4}$ cwt. That shown by Mr. Campion was mounted on wheels, and therefore unsuited to railway transit. Mr. Cluett's was made of a uniform width throughout; the lid fitting inside and floating on the surface of the milk—beautiful in theory, but unsound in practice—a little rough usage would prevent the lid from working. Vipan and Headly showed several substantial cans. They were constructed of strong tinned charcoal-iron; the largest was divided into two compartments, mounted on wheels, and fitted with locking cover and ventilating pipe, and taps for drawing off the milk. A smaller can by the same makers was also mounted on low wheels, with the object of facilitating its movement when full. No. 1918, exhibited by Messrs. Alway and Sons, was considered the best adapted for railway transit; it is tapering from the bottom upwards. The material of which it is constructed is of itself sufficiently strong to enable the use of hoops or outside casing to be dispensed with; and the can is free from inside angles and projections, is fitted up with malleable cast-iron top, and also with an inner and outer lid. A practical fault would be met by constructing both in one, in the form of an ordinary bottle-stopper: when separate, the inner lid is liable to get lost.

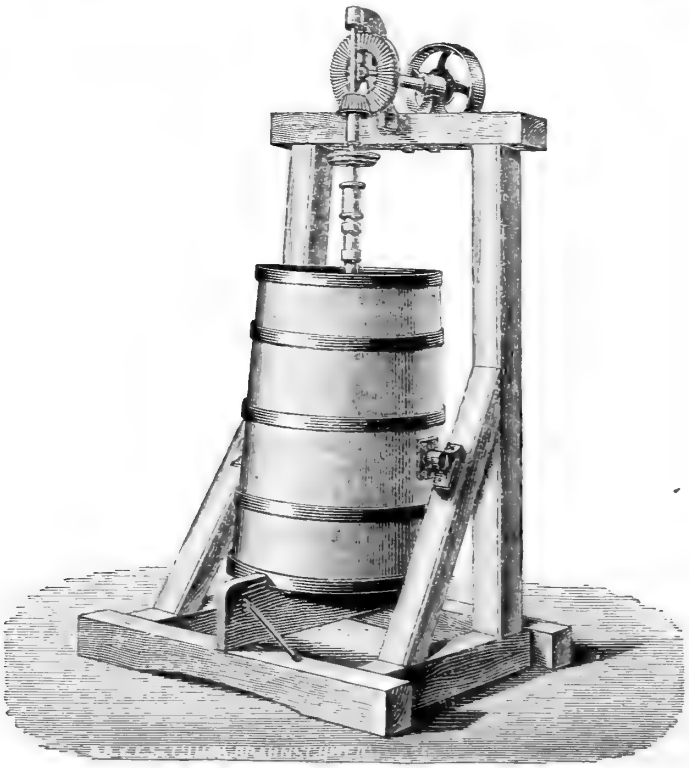
The cans were all subjected to a severe practical test; they were filled with milk and placed side by side on a truck, and drawn by a traction engine at a high speed over very rough ground for a considerable distance round the Showyard, the Judges and others riding on the truck. All the lids of the cans were removed in order to observe the action of the milk inside the cans of different constructions. Having tested and thoroughly examined them in every possible way, we unanimously agreed to award the prize of 10*l.* to No. 1918, Alway and Sons, as most nearly fulfilling all the practical requirements of the Society, highly commending Vipan and Headly for No. 1684.

Class II.—Churns capable of dealing with a Quantity of Milk sufficient to produce not more than 20 lbs. of Butter.

There were 19 entries in this Class, contributed by 14 different exhibitors. The estimated capacity of the different churns varied from 7 to 70 gallons; the Society's instructions were explicit, so that the latter were equally as eligible as the former. Of these 11 came up for trial. A line of shafting, driven by

a steam-engine, was fixed in the trial-shed for the purpose of supplying motive power. Several of the exhibitors had considerable difficulty in fixing their churns, so as not to cause the belts to slip. This entailed a loss of time. The shafting was driven at a speed of 81 revolutions per minute. Messrs. Follows and Bate's churn, No. 4022, a small barrel-churn, was constructed of thin cedar, and can be easily cleaned. Those belonging to J. Brown, Llewellyn and Son, Robinson and Richardson, and W. Waide, were all on the ordinary barrel principle. R. Tinkler's was a barrel-churn, with diagonal beaters and intermediate action. Mr. G. Hathaway's was an improved barrel-churn, with a metallic mouthpiece, and the dash-boards of which were readily removed for facility of cleaning. Mr. Ahlborn's differed materially from anything in use in this country, its outward appearance more nearly resembling the old Scotch plunge-churn of a bygone age; it was a vertical

Fig. 1.—*Mr. Ahlborn's Prize Holstein Churn* (*No.* 2116), *in Class II.*



barrel, slightly conical in shape, hung from central pivots, so as to admit of being easily turned upside down, if required for emptying and cleaning, and was supported on a wood frame. A wood spindle, armed with two thin wings, or strips of wood, 3 inches wide, runs on a central boss in the middle of the churn; power is communicated by bevel gear from a counter shaft, supported on the top of the frame, to which the upper end of the spindle is connected.

Before distributing the milk to the various competitors on the morning of the 9th, the samples were taken by Dr. Voelcker, both from the surface and bottom of the vat.* We were thoroughly

* The milk used in the experimental trials had a specific gravity of 1·031 at a temperature of 66° Fahr. On standing, it threw up 11 per cent. of cream by measure.

The milk brought into the yard on the evening of the 8th of July was received into a large vat. Before distributing the milk to the various competitors on the morning of the 9th, it was well stirred up, but in the short space of a quarter of an hour a partial separation of the cream took place, as will be seen by the following trials.

A sample of milk taken from the top of the vat, in the course of 12 hours threw up 15 per cent. of cream, by measure. Temperature of milk, 63° Fahr. Another sample taken from the bottom of the same vat, in the same period, and at the same temperature, produced only 4 per cent. of cream, by measure.

It is of the highest importance to bear in mind in trials on the production of butter by different churns, that a partial separation of cream rapidly takes place in milk, and it is to be feared that the great differences in the quantities of butter produced in different churns in recorded trials from a given quantity of milk are mainly due to this source of error, which the Judges in the Bristol trials have overcome by not giving each competitor his full quantum at once, but by doling out the milk in two-gallon lots all round, continuing to well stir the milk in the large vat all the time. As soon as all the competitors had obtained their allowance, test samples were taken after a few turns of each churn, to secure a perfectly uniform condition of the milk, and these samples were set aside in separate cream-gauges, at 12.30 P.M. on the 9th; and at the same time the temperature of the milk in each churn was taken. At 9 o'clock on the morning of the 10th, the percentage of cream was registered with the following results:—

MILK USED IN CHURNING ON THE 9TH OF JULY, 1878.

Churn.	Percentage of Cream on the 10th July.	Temperature of Milk on the 9th, before Churning.
Number.	Per cent.	°
2116	7	62
2018	7	64½
2022	7	64
1904	7	64½
2347	7	62
1974	7½	64½
1813	7	65
1953	7¼	65
2088	7	64
6346	7	64
4023	7	64

The result, it will be seen, was most satisfactory; the greatest variation in the

aware of the difficulty of furnishing each competitor with a uniform quality of milk. As the practical value of the trials entirely depended on this, we exercised the utmost vigilance in its distribution, and, instead of giving each competitor his full quantum at once, we doled it out in two-gallon lots all round, continuing to well stir the milk in the vats all the time. As soon as all the competitors had obtained their allowance, test samples were taken in a separate cream-gauge from each churn, and the Catalogue number was attached to each gauge. These samples were set up at 12.30 P.M. on the 9th, remaining in the dairy, at a mean temperature of 56°, until 9 o'clock on the morning of the 10th, when the percentage of cream was registered. The result was most satisfactory, the uniformity of quality far exceeding our most sanguine expectations—they varied one-half per cent., and that in a single instance only. The quantity of butter obtained varied from 1·241 to 2·117 per cent. This was a meagre result, as the milk was above an average quality. This confirms our opinion that the churning of sweet milk is a wasteful system, as it is scarcely possible to extract more than half the butter from perfectly sweet milk; where the practice obtains the milk is always soured, or, to use a provincialism, "sappered," before being churned, and, if so, quality is sacrificed at the expense of quantity: it is impossible to produce fine butter from either sour milk or sour cream. In a good dairy, having an equable temperature of 55°, the milk should stand 36 hours, and be skimmed thrice, or every 12 hours; the cream should be churned regularly every day, and in this way not only the greatest quantity, but the best quality of butter can be obtained. Where the skim-milk and buttermilk can be utilised and a really fine quality of butter made, it is unquestionably the most profitable system of dairy management. In this department there is still a wide field open to the enterprising

---

percentage of cream amounted only to ½ per cent., and that only in a single instance.

When the milk was received in the temporary dairy, it threw up 11 per cent. of cream, but after the agitation to which it was submitted in distributing it amongst the different competitors, the percentage of cream that rose to the top amounted only to 7 per cent., clearly showing that the percentage of cream which milk throws up when it has undergone more or less violent agitation, cannot be taken as a sufficient test of the quality of such milk.

The buttermilk produced in making butter on the 9th, was tested for cream in four instances. The buttermilk from—

						Temperature of Buttermilk.
Churn No.	2088	threw up in	12	hours,	4 per cent of cream	67° Fahr.
,,	1904	,,	,,	4	,, ,,	67° ,,
,,	2088	,,	,,	4	,, ,,	679 ,,
,,	2116	,,	,,	4	,, ,,	679 ,,

The rest of the buttermilks were not tested, the makers having used cold water or lumps of ice in churning.—A. V.

TABLE I.—RESULTS of TRIALS of CHURNS in CLASS II. with MILK.

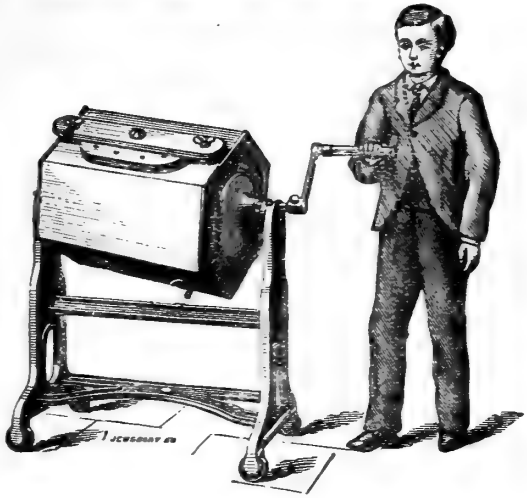
Number.	NAME OF EXHIBITOR.	Quantity.	Temperature.	Speed.	Time.	Quantity of Butter from Churn.		Quantity after once passing through Ahlborn's Butter-worker.		Quantity of Butter after passing twice through Butter-worker.		Percentage of Butter.
		Galls.	°		Min.	lbs.	ozs.	lbs.	ozs.	lbs.	ozs.	
2088	Taylor and Wilson	10	64	102	39	1	5½	1	4½	1	4½	1·241
1953	James Brown	16	64	42	61	3	2	3	1½	3	1	1·933
6346	H. E. Mines	10	64	44	101	1	11¼	1	11¼	1	11	1·640
4023	Follows and Bate	8	64	48	58	1	7	1	5½	1	5	1·679
1813	George Llewellyn and Son	20	64	43	56	3	13	3	11	3	11	1·843
1974	Robinson and Richardson	20	64	44½	49	3	9½	3	8	3	7	1·750
2347	T. Bradford and Co.. ..	20	62	42	66	3	5¼	3	5	3	4	1·656
1904	R. Tinkler and Co. ..	40	62	29	84	6	7	6	6	6	5½	1·593
2022	W. Waide	40	62	36	45	7	3½	6	14½	6	14	1·726
2018	G. Hathaway	40	62	31	60	6	15½	6	11½	6	11	1·679
2116	E. Ahlborn..	40	62	120	40	8	9	8	7½	8	7	2·117

manager. At least 80 per cent. of the butter made in England is still only of a second or third-rate quality. The manager of the Midland Hotel, Derby, tells me that, although living in the centre of one of the best dairy districts in England, he imports all his fresh butter from Normandy. His average consumption ranges about 200 lbs. per week, and if he could obtain an equal quality in the Derby market, he would greatly prefer to purchase there. As to the yield of butter, I have some reliable data which may be of interest to the reader. The accounts of a butter dairy have passed through my hands for some years. The cows are principally pure-bred Shorthorns with a few Ayrshires; the quantity of butter varies from 30 lbs. to 80 lbs. per week; throughout the year the milk is all measured into the dairy, and an accurate account is kept of how it is disposed of, and monthly abstracts are made out. I need scarcely say that the cows are well kept, both during summer and winter. The quantity of butter is within a fraction of 4 per cent., or, in other words, $2\frac{1}{2}$ imperial gallons of milk produce 1 lb. of butter.

Class III.—Churns for churning a sufficient Quantity of Cream to produce not more than 20 lbs. of Butter.

There were 39 entries in this class, 16 of which came up for trial; these were constructed on various principles. Messrs. Follows and Bate showed a barrel-churn with revolving beaters. A considerable number were revolving barrels with fixed beaters. Of this class Messrs. Tinkler and Co., W. Waide, Hathaway, Robinson and Richardson, and Llewellyn and Son exhibited well-known examples; these differ in the arrangement of the beaters, and the means of ventilation, which is accomplished by an air-valve, which, if desirable, can easily be made self-acting. Mr. Ahlborn's vertical "Holstein," already described, Bradford and Co.'s "Midfeather" and "Declivity," and Thomas and Taylor's "Self-acting Patent Eccentric" did good work. The churns by these makers are somewhat similar in construction; an important point in their favour is the facility they afford for removing the butter. In this trial each competitor was allowed to wash and make up the butter in his own way, and as he considered fit for market. That from the "Holstein" churn was washed in the churn, and was never touched at all by the naked hand. In this trial the Judges inadvertently committed a practical mistake, in meting out full quantities of cream to each churn at once. It ought to have been dealt out in two-gallon lots all round until each churn had its quantity, as was done

Fig. 2.—*Messrs. Thomas and Taylor's Prize Patent Self-acting Eccentric Churn* (*No.* 2244), *in Class III.*



with the milk; but as it was, those filled first had much the richer cream. As a practical test, this trial was therefore worthless, but the Judges think it worth recording here, if only as a beacon to warn future experimenters from committing the same error. The quantity varied from 26·06 to 41·87 per cent. This can, to some extent, be accounted for by the want of skill in manipulation, but is chiefly due to the cause just indicated. In some of the samples a much greater quantity of buttermilk and of water was left than in others; these impurities increased the weight, but depreciated the market-value. Although all made from precisely the same cream, we considered the butter to vary in value at least 6*d.* to 8*d.* per lb. From this trial we selected, as the best qualities of butter, Nos. 2244, 2021, and 2087. Being particularly desirous of thoroughly testing the merits of the different churns, and, if possible, of arriving as far as practicable at a sound decision, in order to satisfy our own minds, we found it necessary to give the churns another trial, and to supply each competitor with 30 lbs. of cream. This was a most satisfactory trial. The results showed a remarkable uniformity in the yield of butter; the competition throughout was an exceedingly close one, involving a degree of individual merit highly creditable to the manufacturers. The quality, however, was not nearly so uniform; this we attributed partly to the speed and partly to the number of beaters, whether fixed or portable, inside the churn. Rapid churning, particularly at the commencement

TABLE II.—RESULTS OF THE TRIALS OF CHURNS IN CLASS III. (SECOND TRIAL WITH CREAM).

Number.	NAME OF EXHIBITOR.	Article.	Quantity.	Temperature.	Speed.	Time.	Quantity.	Quantity after passing through Butter-worker.	Percentage of Butter.
			lbs.	°		Min.	lbs.	lbs.	
2008	Hathaway, G.	Revolving Barrel	30	61	38	35	12½	11¼	37·50
2355	Bradford and Co.	Declivity	30	61½	68	15	12	11½	40·06
2342	Ditto	Midfeather	30	61½	56	23½	12½	11½	37·50
1973	Robinson and Richardson	Barrel	30	61½	54	25	12⅜	11½	41·25
1972	Ditto	Barrel	30	61½	54½	25	12	11½	40·00
2021	Waide, W.	Revolving Barrel	30	61½	54	31	12⅛	11⅜	40·41
1903	Tinkler and Co.	Revolving Barrel	30	61½	55	19½	12⅛	11⅛	40·83
1954	Brown, James	Barrel	30	61½	45	33	12	11½	40·00
4022	Follows and Bate	Barrel, revolving beaters ..	30	61½	32½	27½	12⅜	11⅜	42·50
6347	Mines, H. E.	American	30	61½	93	21	12⅛	11⅜	40·83
1807	Llewellyn and Son ..	Revolving Barrel	30	61½	56	23	12	11½	40·00
2117	Ahlborn, E.	Vertical	30	61½	121	15	11¼	10¾	37·50
2087	Taylor and Wilson ..	Dexter	30	61½	56	12½	12⅜	11	41·25
2244	Thomas and Taylor ..	Self Ventilator	30	61½	62	24	12⅛	11½	40·41
2245	Ditto	Patent Eccentric	30	61½	51	24	12	11⅜	40·00

TABLE III.—RESULTS OF TRIALS OF SELECTED CHURNS IN CLASS III. (THIRD TRIAL WITH CREAM).

Number.	Name of Exhibitor.	Article.	Quantity.	Temperature.	Speed.	Time.	Butter.	Butter after passing through Butter Worker.	Percentage of Butter.
			lbs.	°		Min.	lbs. ozs.	lbs. ozs.	
1973	Robinson and Richardson ..	Barrel	21	61	55	15	3 10¼	3 9¼	17·55
2021	Waide, W.	Revolving Barrel ..	21	61	60	18½	3 13¼	3 11¼	17·63
2008	Hathaway, G.	Revolving Barrel ..	21	61	56	16½	3 11¼	3 9¼	17·55
2241	Thomas and Taylor	Patent Eccentric ..	21	61	126	19	3 11¾	3 10½	17·26
1807	Llewellyn and Son	Revolving Barrel ..	21	61	60	14½	3 10½	3 8¾	16·87
2342	T. Bradford and Co.	Midfeather	21	61	52	15	3 12½	3 10¼	17·26
2117	Ahlborn, E.	Vertical	21	61	50	17	4 1¼	3 15	18·75

NOTE.—The discrepancy in the percentage of Butter as compared with the previous Table is accounted for by the Cream in this case having been largely diluted with milk. Being of uniform quality, it in no way affected the value of the Trial.

of the operation, is fatal to the production of a really fine quality of butter; by rapid churning the fatty globules may be so broken up, that it sometimes becomes impossible to get the butter at all, and in this case we have known the ignorant and superstitious attribute it to the power of witchcraft. The success of Mr. Ahlborn, with his small dashers, in the milk-trials, and that of Messrs. Thomas and Taylor's "Peg" arrangement, with the cream, fully confirm our opinion that numerous and large dashers are a mistake; though both these competitors finished at a high speed, the percentage of butter, when washed and removed from the churn, varied from 12⅜ lbs. (the highest) to 11¼ lbs. (the lowest). After having been passed through Ahlborn's butter-worker, the highest was 11⅝ lbs., and the lowest 10¾ lbs. In order that each individual competitor should not have cause to complain of having been placed at a disadvantage, we decided to submit the seven which in our opinion possessed the highest order of merit to a final trial on Friday morning, and arranged that the competitors should have nothing to do with their working, but that the churns should be driven by the Society's servants. They each had an allowance of 21 lbs. of cream, at a temperature of 61° Fahrenheit. The butter was washed and weighed from the churn, at once passed through the butter-worker, and again weighed: it gave from the churn 4 lbs. 1¼ oz. and 3 lbs. 10¼ oz. as the highest and lowest respectively; after having been passed through the butter-worker, the quantities were reduced to 3 lbs. 15 oz. and 3 lbs. 8¾ oz. respectively, as shown in the accompanying Table, p. 145.

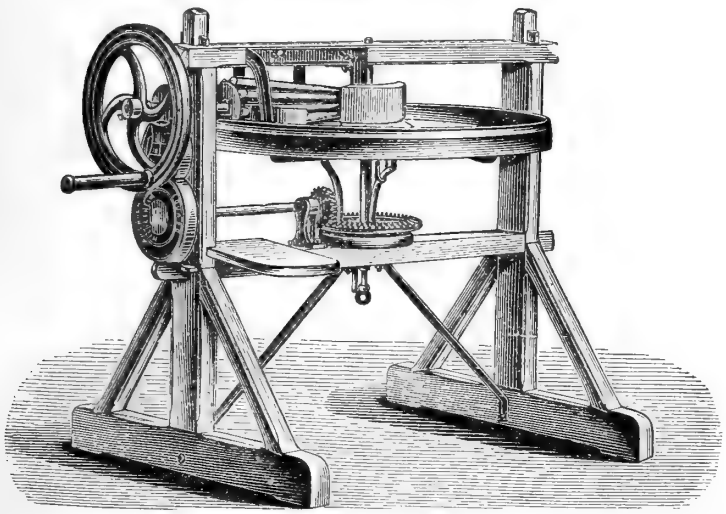
Guided by the quality of the butter and the general results of the repeated trials, we awarded the first prize to No. 2244, Messrs. Thomas and Taylor; highly commended No. 1973, Robinson and Richardson; and commended No. 2342, T. Bradford and Co.

Class IV.—Mechanical or Automatic "Butter-workers," suitable for large Dairies and for Factories.

There were 4 entries and only 3 competitors in this class. Mr. Ahlborn's machine (No. 2118) consists of a circular table, slightly sloping from the centre to the circumference, with a rim or hoop standing some 2 inches above the edge of the table. Round the outer edge of the surface of the table runs a shallow groove, into which trickles the expressed fluid, which flows through a pipe into a vessel set underneath. The butter is placed on the table, and is carried under a fluted roller driven by hand. Motion is communicated to the table by a small counter-shaft and pinion movement. The roller is held in position by a thumb-screw, and the pressure regulated at pleasure.

A wedge-like piece of smooth wood is placed at each end of the roller, and acts as a guide to keep the butter from passing off the table. The attendant turns the butter over with wooden boards: in passing through all the different operations it never comes into direct contact with the naked hand.

Fig. 3.—*Mr. Ahlborn's Prize Mechanical Butter-worker* (*No.* 2118), *suitable for large Dairies* (*Class IV.*).



Mr. Hancock's butter-worker (No. 1818) is simply a piston working in a cylinder, the bottom of which is perforated by numerous small holes. The butter is placed in the cylinder, and sufficient pressure is applied to the piston, screwed down so as to force the butter in spiral threads through the small orifices at the bottom. No. 6348 is an American machine, somewhat resembling No. 2118, to which the First Prize was awarded, only that a fluted roller is made to work backwards and forwards along an inclined straight table.

No.	Name of Exhibitor.	Article.	Quantity.	Time.	Quantity.	
			lbs.	Minutes.	lbs.	oz.
2118	Ahlborn, E.	Butter worker, No. 3	5	1½	4	14¼
2066	Greenwood, Hancock and Co.	Butter purifying-machine	Did not compete.			
1818	Hancock, F. and C.	Butter worker and washer ..	5	2	4	12¾*
6348	Mines, H. E.	Butter worker and washer ..	5	1½	4	14¼

* The smaller quantity of butter after being washed was in this case due to loss by adhesion to the flannel cover of the piston and to the case of the machines, and not to more thorough working or pressing-out of the butter-milk or water.

Class V.—Mechanical or Automatic Butter-workers, suitable for small Dairies.

There were 8 entries and only 5 competititors in this class, but only 3 came up for trial. No. 2119, capable of working 5 lbs. of butter, and No. 2121, of a capacity for dealing with 2 lbs., both belonged to Mr. Ahlborn, and were tried with 3 lbs. each. The former occupied 2½ minutes, and reduced the quantity to 2 lbs. 15 oz.; the latter occupied 1 minute, and reduced the quantity to 2 lbs. 15¼ oz. The other was No. 1819, belonging to Messrs. F. and C. Hancock, and constructed on the same principle as that tried by them in the preceding class. The quantity for trial was 3 lbs., and the time occupied 2½ minutes. When again weighed, the butter had decreased to 2 lbs. 13½ oz. One of the two machines shown by Mr. Ahlborn was extremely simple. It consisted of a board 3 feet long and 10 inches wide. Each side of the board has a raised projection of about 1 inch in height; it is traversed by a fluted roller, having at each end a groove, which fits the raised projections on the sides of the board. The roller has projecting wooden handles at each end: these are grasped in each hand, and the roller is moved backwards and forwards over the butter as it lies on the board. The end of the board next to the operator is supported by two legs; the other end rests on a tub or other vessel (Fig. 4). The legs are fastened to the board by hinges, and are folded under it when the board is not in use. For the amateur, or small farmer, or cottager, this is a most useful article, for the maid-of-all-work is seldom a good butter-maker. This is so simple an appliance that the inexperienced may use it as successfully as the most skilful; and the price, from 7*s.* 6*d.* to 10*s.* 6*d.*, places it within the reach of all. The prize was awarded to No. 2121. The other machine, No. 2119, shown by Mr. Ahlborn, was of precisely the same construction as No. 2118 in Class IV., only of smaller size.

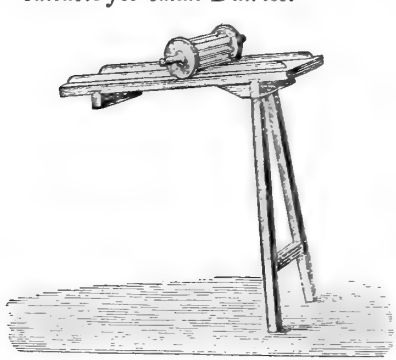


Fig. 4.—*Mr. Ahlborn's Prize Mechanical Butter-worker* (*No.* 2121), *suitable for small Dairies.*

Class VI.—Cheese Tubs.

The chief points to be considered were facility of filling and cleaning, mode and cost of heating, method of drawing off whey, and general economy of labour in putting in milk and getting out curd.

There were 10 entries in this class, 7 of which came up for trial. They varied considerably in construction, representing several systems of cheese-making. Whether it be in the farm-house or the factory, if a really fine quality of cheese is to be made, steam must be used. Hot water is not sufficiently sensitive or controllable; hence it is impossible at all times to regulate the temperature to that degree of nicety so essential in the production of first-class qualities of cheese. No. 2122, exhibited by Mr. E. Ahlborn, is a strong metallic vat, having a capacity of 100 gallons. Inside is a false bottom, constructed of tinned copper, between which and the wooden bottom is a space of several inches for the purpose of holding steam or water. This space is supplied from the outside by a pipe, having a funnel-shaped mouth; on the opposite side is a tap for running off the water, and another for drawing off the whey. To prevent the milk from entering the whey-pipe when the tub is filled, a long plug, reaching to the top, is used. This is objectionable, as it rather interferes with the operation of cutting the curd. No. 2381, H. Bamford and Sons, is the patent circular brass cheese-making apparatus. This apparatus is largely used in the farm-house dairies of Staffordshire and Derbyshire. It is applicable to steam, but hot water is more generally used. No. 2045, David Noble, is circular in shape, constructed of strong tin, supported on a wooden stand fitted up with steam-pipes and hot-water chambers, with a tap at the bottom to draw off whey. It is extensively used in the Cheddar dairies of the south-west of Scotland. No. 6325, Wilkins and Sons, is a tin tub with brass rim, circular in shape, with lifting platform and rotatory knife. This is constructed for heating either by steam or hot water. No. 6350, H. E. Mines, and No. 2039, William Gilman, and Ahlborn's, resemble each other, and are constructed on the American principle—or that generally used in cheese-factories. They consist of an outer and an inner case, the former of which is constructed of deal and the latter of tin, attached to a wooden ledge, which rests on the upper lip of the inner case. A coil of pipes is arranged lengthwise inside the outer case; a continuous flow of cold water circulates through these during the night, to lower the temperature of the milk: steam or hot water is used when the temperature requires to be raised. A skeleton wooden frame rests on the pipes, and supports the weight of the inner

vat. No. 1512, Reuben Cluett, was mechanically on the same principle, but constructed internally of strong tin, and mounted on wheels. The bottom of the inner vat was sloped to the centre, with a fall to one end. The advantage gained by this arrangement is that the whey drains better from the curd. The curd-knife was of the ordinary shape, and exactly fitted the vat in width and form of bottom, and was worked by a handle attached to the centre; the cutting edges were so arranged as to cut the curd into small cubes at one operation. The vat could be heated either by steam or hot water. The whey and the curd were easily removed, and it was equally available for the factory or the farmhouse dairy. The catalogue price of 15*l.* 10*s.* was moderate. We considered this the most nearly to fulfil the Society's conditions, and awarded it the First Prize.

Class VII.—Curd Knives.

There were 7 competitors for this prize. Mr. R. Cluett's convex knife, already described, though fully answering the purpose for which it is constructed, is not generally applicable to every description of vat; and the same remark applies to Mr. Wilkins's rotatory knife, No. 6327. Practical cheese-makers differ in their mode of manipulating the curd. There is no doubt that the quality of the cheese may, to a certain extent, be deteriorated in value by the application of a wrong principle to the cutting of the curd. When a blunt instrument is used, it may be bruised, and a portion of the butter washed out, or it may be cut too coarse. When this is so, and the temperature is rapidly raised, a portion of the whey becomes hermetically sealed in the granules of curd, which no after pressure can expel. The quantity of whey so enclosed, however small, sets up a fermentation, which soon completely destroys the clean flavour of the cheese. The infant curd, when first cut, is excessively tender and easily injured; it requires steel knives as thin as can possibly be made, and as sharp almost as a razor, and should be used by skilful hands to accomplish the work satisfactorily. The most satisfactory knives were No. 2123, shown by Mr. Ahlborn, and No. 2040, by Mr. William Gilman. These were no new inventions, but they have been somewhat improved. They were first introduced into this country from America, in 1869, by Messrs. Schermerhorn, who came over to manage the Derbyshire cheese-factories. These knives are of cast steel. The vertical knife is made 20 inches long and consists of 16 blades, which vary from $\frac{3}{8}$ to $\frac{1}{2}$ inch apart. This knife is passed longitudinally through the curd in the vat, cutting it into columns.

The horizontal knife is constructed of the same materials, and

the blades are placed the same distance apart. This knife is passed through the curd, cutting it into cubes. The temperature is then slowly increased and the whey expelled. When in skilful hands, these knives are equally applicable to any system or any description of vat. The prize of 3*l.* was awarded to Mr. W. Gilman for No. 2040, as being, in the opinion of the Judges, the best adapted to general purposes.

Class VIII.—Curd-Mills.

The use of a curd-mill is to reduce the mass of curd into separate particles, which become cooled and aërated during the operation. There are three separate principles of arranging the working parts. In one, the hopper is fixed to an iron or wood stand, and the ground curd is delivered from a spout into a receptacle prepared to receive it; in another, the hopper and movable part are attached to a skeleton-frame, called a ladder, resting on the top of the tub or vat into which the curd falls when ground; the third is attached to the lip of the tub by a clip, and held in its place by set-screws. The mechanical arrangement likewise differs considerably. One consists of a metallic, galvanised, slotted concave, into which are geared either one or two cylinders, on which are fixed rows of hooked teeth. These work into the slots of the concave, carrying portions of the curd with them as they revolve; the others consist either of one or two rollers, the teeth of which are variously engaged. The rollers are sometimes made of wood, but more commonly of galvanised iron. They are driven by hand at a high speed. No. 2041, exhibited by William Gilman, though very roughly constructed, was on correct principles. It consisted of two wooden cylinders, with iron spikes placed in rows. To my mind its great merit consisted in the cylinders revolving at different speeds, thus insuring greater regularity of feed and better work. The prize in this class was awarded to Mr. Bamford's mill, No. 2380. This was made entirely of galvanised iron. It consisted of two spiked cylinders, working up to a spiked breast. The hopper, when turned back, sets the cylinder free. All the working parts admit of being removed with the greatest facility and despatch, and can easily be cleaned. It is highly essential that all the working parts of a curd-mill which come into direct contact with the curd should be cleanly finished, otherwise there is the danger of the curd being bruised, and a portion of the butter separated. The time occupied in grinding 10 lbs. of curd of a uniform quality varied from 5 to 40 seconds.

Class IX.—Cheese-Turners.

There were only 3 competitors in this class. These were Mr. H. E. Mines, of 79, Redcliff Street, Bristol, Messrs. H. Bamford & Sons, of Uttoxeter, and Messrs. Carson and Toone, of Warminster, Wilts. All the appliances were on the same principle of construction, though slightly differing in detail. There is nothing either particularly new or original in these inventions. A similar contrivance has been in use in Leicestershire many years. In these times of dear labour it is likely to come into more general use. The turner of Messrs. Carson and Toone, to which the Prize was awarded, consists of two cast-iron standards, springing from a base which rests on the floor. These standards are secured in position by a top and bottom brace, which, correctly speaking, together form a square frame. Attached to these standards is an inner frame, hung on a central pivot, on which it revolves. The inner frame consists of a series of wood shelves, braced and supported by wrought iron. The turners are made in lengths of about 6 feet, and hold from 30 to 40 cheeses. When evenly loaded throughout, they are easily turned by a crank-handle which fits on to the end of the centre-pin. On one side of the board a quadrant-shaped lattice projects, which prevents the cheeses from slipping off when being turned. Messrs. Bamford's differed only slightly from the Prize Turner in matters of detail.

Class X.—Mechanical Means of Cleaning Churns and other Dairy Utensils.

Messrs. Wilkins and Sons were the only competitors in this class. Their invention consisted of a small conical boiler, in the top of which was inserted a pipe secured by a steam tap. To this pipe was attached an india-rubber hose. This was introduced into the vessel to be cleaned, and steam from the boiler turned on. It was not considered by the Judges to be of sufficient practical utility to merit the award: the prize was therefore withheld. As the supply of milk to towns becomes more general, some cheap and effective means of thoroughly cleaning dairy utensils is a pressing want. In the majority of cases, hot water is the only agent at command; it is most effective, when used with ordinary care. Owing to the time and trouble it involves, the work is often very imperfectly performed.

It is a common practice in many dairies to use either steam or hot water exclusively for cleansing the dairy vessels, and to this cause alone may be attributed much sour milk and strong-flavoured cheese and butter. Hot water, when used at a temperature only slightly under 212°, instead of removing impurities,

acts on the caseine and butter, causing it to form a thin glassy film on the inner surface of the vessels; hence certain seed-germs are preserved and communicated to the next supply. Dairy managers should insist upon every vessel that has come into contact with milk being first carefully rinsed in cold water, and afterwards either steamed or scalded at a temperature of not less than 212°.

Class XI.—Automatic Machines for Preventing the Rising of Cream.

Mr. H. E. Mines was the only competitor. The system employed is that generally practised in the cheese-factories both in England and America. Though very imperfectly worked by the exhibitor, the practical utility of the system is fully recognised as being far superior to any other in use, and the Society's prize was therefore awarded to it. The evening's milk is delivered into the ordinary factory cheese-vat, consisting of an outer and an inner vat, the space between them containing coil-pipes, which convey the water from a tank or reservoir situated at a higher level than the vat. For the convenience of working, this pipe is connected to the vat by a portable hose, which can be detached at pleasure. The flow of water is regulated or shut off by a stop-cock on the water-pipe. At the opposite end of the vat is an outlet-pipe, of the same diameter as the feed-pipe; to this, again, is attached a portable tin pipe, which conveys the water to a miniature overshot water-wheel. This wheel is about 2 feet in diameter; the buckets are close, and about 6 inches wide, at right angles with the vat; and opposite the centre a wood or iron shaft is hung in bearings. Perpendicularly attached to this shaft is a lever-arm, depending exactly over the centre of the vat. Two horizontal shafts, one on each side, meet and are secured to the lever by a thumb-screw. At right angles to the ends of these shafts are fixed rakes, consisting of three round deal rods, of about one inch in diameter. The axle of the water-wheel is connected to the main-shaft by a light strip of wood. When the water is turned on, it rises slowly in the vat until it reaches the level of the outflow-pipes, through which it passes on to the wheel. As soon as one or two of the buckets are filled, it causes the wheel to make a single revolution, which is communicated to the shaft, and the rakes or floats move backwards and forwards, slightly agitating the surface of the milk. Having made one revolution, the wheel comes to rest for a few seconds, until the buckets are again filled; and the same operation continues to be repeated as long as required. This not only prevents the cream from rising; but the constant

circulation of cold water through the vat reduces the temperature, whilst the constant stirring aërates and dispels the animal odour.*

Class XII.—Milk Coolers.

There were 5 exhibitors in this class. These were Greenwood, Hancock, and Co., Lawrence and Co., Wilkins and Son, H. E. Mines, and G. Campion. Lawrence and Co. were the only exhibitors who came up for trial. Their Refrigerator is now well known. It consists of a coil of pipes, which occupy a space of 2 feet 6 by 6 inches. A tank containing cold water is placed at a higher level than the cooler; this tank is generally supplied by a force-pump from a well in the farmyard. The cooler is fixed on a wood frame; the water flows through a pipe from the tank, and enters the bottom of the cooler, and slowly circulates through the pipes to the top, where it passes off by an overflow. The pipes are enclosed in a corrugated tin case, at the top of which is a small trough, the bottom of which is perforated with small holes throughout its entire length. The milk flows through these holes, and follows the corrugations of the outer surface, the temperature of which is reduced by the circulation of the cold water. Inside, in its downward course, the milk is not only cooled, but it is to a great extent purified, broken up, and aërated, and all animal heat and smell are removed. Whether the milk is to be manipulated in the home dairy or the factory, or goes to the milk-vendor, it should be cooled as soon as it is drawn from the cow. From practical experience I am fully convinced that a really uniform and first-class quality, whether of butter or cheese, cannot be produced unless this point is strictly enforced. The losses sustained by those who send their milk long distances by rail have fully convinced them of the necessity of cooling. The result of the trial with Lawrence's cooler was that the temperature was reduced from 105° to 65° in one minute. The water was raised into the cistern by a force-pump, the temperature of the water at the time being 64°. The machines are made in three sizes. The smallest will cool 80 gallons an hour, price 4*l.*; the next will cool 125 gallons an hour, price 5*l.*; and the largest 175 gallons an hour, the cost of this being 6*l.* 15*s.*

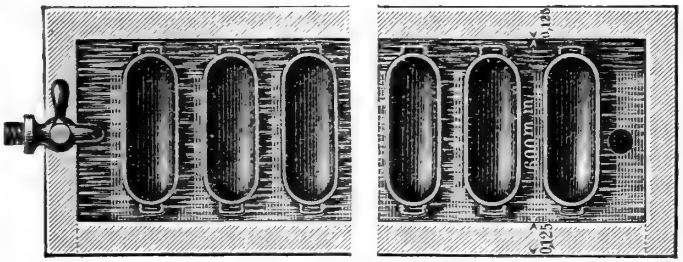
* The Bristol trials on automatic machines for preventing the rising of cream were by no means favourable to Mines's appliances. A sample of milk, which produced in twelve hours 15 per cent. of cream, the temperature having been 62½° Fahr., was tested next morning, the 9th July, after having been in Mines's agitator all night on the 8th. A sample taken from the top of the vat threw up 20 per cent. of cream after two hours' standing in a cream-gauge, and the second sample, taken from the bottom of the vat, produced 12½ per cent. of cream in the same time: thus showing that the agitator did not prevent the rising of the cream—A. V.

CLASS XIII.—METHOD OF KEEPING A LARGE QUANTITY OF MILK AT A TEMPERATURE OF UNDER 40° FAHRENHEIT, FOR A PERIOD OF NOT LESS THAN 12 HOURS, SUFFICIENTLY ECONOMICAL FOR PRACTICAL PURPOSES.

A prize of 20*l.* was offered in this class, and there were 3 entries, but none of the exhibitors succeeded in complying with the conditions.

That known as the Swartz system consists of deep-setting cans, 2 feet long, 20 inches deep, and 6 inches wide, are filled with new milk, and placed side by side in a vat, or cistern, filled with cold water. If the temperature of the water can be still further reduced by the use of ice, so much the better. A wooden vat may be used; a slate or brick-and-cement cistern would answer

Fig. 5.—*Trough with deep Cans for Setting Milk on the Swartz System.*



the purpose better, particularly where water is plentiful, and capable of being so contrived that a constant circulation could be kept up by gravitation. Milk at a low temperature will keep sweet for a long period, and the cream rises very rapidly and in large quantity. Deep setting, however, is opposed to English ideas. The trial commenced by setting the milk at 11·45 on the night of the 8th July, the temperature then being 66° Fahrenheit; at seven o'clock on the morning of the 9th the temperature had risen to 77½°. Ice was then used, and by 10 o'clock the temperature had fallen to 48°; at 10 A.M. of the 10th the temperature was 43°. The milk was skimmed on the 11th at 12·30. The cream was perfectly sweet and in full quantity, and the butter made from it was of excellent quality. On the recommendation of the Judges, the Council awarded a special prize of 10*l.* to Mr. E. Ahlborn. Since the Bristol Meeting I have tested the Swartz system,* and am fully convinced of the superior quality of the butter produced by that method.

* Of late, an American of the name of Cooley has announced the discovery of this property and the perception of its practical bearing on Dairy-husbandry as his own (see 'Farmer,' December 30, 1878).—ED.

The Judges greatly regret that there was no entry in Class XIV. for the best Milking-machine. He who successfully solves the difficulty will reap a rich reward. The want of such a machine is the one missing link in dairy management. Greater mechanical difficulties have been overcome, and we hope before many years to see the milking-machine difficulty practically solved.

Before closing this Report we beg most heartily to record our thanks to Dr. Voelcker for his attention and able aid, and to the Stewards for their courtesy and assistance.

(Signed) G. Mander Allender.
T. Rigby.
Gilbert Murray.

Note on Swartz's System.—At 11.45 on the night of the 8th of July, 36 gallons of milk were put in Ahlborn's deep-setting cans, kept surrounded by cold water, in accordance with Swartz's system, the temperature at that time being 66° Fahr. At 7 o'clock in the morning of the 9th of July the temperature of the milk was 72½°, and thus had risen 6½° during the time it had been set. Lumps of ice were then placed into the water surrounding the setting tins, and in an hour's time the temperature of the milk went down to 48° Fahr. On the 10th, a maximum and minimum thermometer was placed into the milk, and from time to time lumps of ice were placed into the water used for cooling down the milk. At 12.30 P.M. on the 11th, the milk was skimmed, and at that time had a temperature of 47° Fahr. During the 10th and 11th of July, the highest temperature of the milk registered by the maximum thermometer was 65° Fahr., and the lowest 42° Fahr.

On the 10th, the cream, when tested with delicate litmus-paper, was found to be perfectly neutral; and on the 11th it was still sweet, and, after some time, gave merely the faintest indication of turning delicate litmus-paper slightly red.

The skimmed milk was perfectly sweet at 12.30 P.M. on the 11th, and did not redden in the slightest degree delicate litmus-paper, showing that no trace of acid had been generated in the milk by keeping it in deep-setting tins, surrounded by cold water, at a temperature ranging between 72½° and 42° Fahr., during a period of 84¼ hours, or 4 days and 3 nights. The cream, which was deliciously sweet, was churned on the 11th, and produced butter of the finest quality, leaving nothing to be desired as regards texture and fine flavour. The following is the composition of the butter made according to Swartz's system of raising cream, a system which has proved most successful both as regards the quantity and the quality of the cream which

it furnishes, and the excellence of the butter which the cream produces :—

Composition of Butter made in accordance with Swartz's system.

Water	13·26
Caseine	·92
Pure butter fats	85·70
Mineral matter (ash)	·12
	100·00

AUGUSTUS VOELCKER, F.R.S.

VIII.—*Concluding Report on the Experiments at the Brown Institution on Pleuro-Pneumonia.* By J. BURDON-SANDERSON, M.D., LL.D., F.R.S., late Superintendent of the Brown Institution. With an Appendix by W. DUGUID, Esq., M.R.C.V.S., late Veterinary Surgeon to the Institution.

THE inquiries which were undertaken in 1876, relating to the origin and nature of pleuro-pneumonia, and to the use of inoculation as a means of preventing its spread, having now been brought to a conclusion for the present, in consequence of the legislative difficulties which stand in the way of further experiment, I beg leave to submit to the Council the following statement of the results of our labours.

The circumstances which led to the inquiry were set forth in a preliminary Report which was published in 1876. At that time no experiments had been made, but our first batch of experimental animals had been purchased, viz., two cows, two calves, and four other animals of different ages. They had been kept at Wandsworth Road for three months—a time which we considered sufficient, but not more than sufficient, to afford security against previous infection. I then stated that we should exclude any *living* source of infection from our premises, but would "try, in succession, every channel of mediate contagion known to us, using in our experiments all that deliberation and caution which the consideration of the importance and difficulty of the inquiry enforced upon us."

Before proceeding with the narrative of our experiments it will, I think, be useful to state somewhat more fully than has hitherto been done, the nature of the practical questions which we have had in view, some of which have now assumed a greater importance than they had at the outset. Our objects have been (1) to ascertain by experiment by what different ways a healthy animal can be infected ; (2) to ascertain whether inoculation is

practically useful; and (3) to discover a way of inoculating an animal without risk.

With reference to the first point, the opinion generally entertained is, that a healthy animal may get pleuro-pneumonia either directly from a diseased animal, or indirectly by being brought into relation with its hide or carcass, or with persons or things that have been in contact with its body. Thus, Mr. Fleming, the author of the well-known 'Manual of Veterinary Sanitary Science,' expressed his belief very decidedly in 1875, that "infection may occur through the medium of forage, straw, &c., which have been soiled and breathed upon by infected cattle, by the utensils which have been used with them, as well as by the persons who have attended to the sick;" and has since that period expressed the same opinion in still stronger terms. An opposite view had, however, been guardedly promulgated by a very high authority. In the excellent article by Professor Brown on the contagious and infectious diseases of animals, which appeared in the tenth volume of the 'Journal,' the author said, that "so far as his own observations had enabled him to decide, the disease is only communicated by the actual contact of a diseased animal with a healthy one, and that it is at least exceedingly probable that the mode of communication is by the inhalation of the breath of the diseased subject."

With reference to the second question, that of the utility of inoculation, opinions are also, as needs scarcely be said, much divided, although the majority are in its favour. One of the strongest arguments against it is founded on the acknowledged fact, that although inoculation as ordinarily practised produces very severe effects, yet these effects are neither the disease itself nor any modification of it. It has, indeed, been alleged by some authorities that actual lung disease can be generated by the insertion under the skin of bits of diseased lung; but this inference, which if it were well established would be of great importance, can be shown to be mistaken. The observations quoted in support of it are too good to be true. In most instances, the time which intervened between the inoculation and the appearance of lung disease was far too short; for we have evidence from the pathological inquiries of Professor Yeo, as well as from other sources, that the development of the disease in the lungs requires a very long time, and usually produces no obvious symptoms at all until it breaks out in the acute form in which it is ordinarily recognised. Consequently, the appearance of symptoms within a week or two after inoculation could not reasonably be referred to the operation as their cause; so that we need not hesitate to conclude that the animals in question had been previously infected by other means.

Another statement that has been made with reference to the

mode of action of inoculation is equally unfounded, viz.: that although inoculation never produces actual pleuro-pneumonia, yet, that it gives rise, at the place where the morbid material is introduced beneath the skin, to a local disease which is of the same kind as the real disease of the lungs, and that consequently the effect of the inoculation is to produce a sort of pleuro-pneumonia of the skin! Now it is quite true that there is a great resemblance between them—a likeness sufficiently striking to have impressed some very well informed persons—but very little stress ought to be placed on it. All inflammatory exudations, whether specific or not, are very like each other as regards their chemical and anatomical characteristics; so much so that it is not possible to distinguish them from each other excepting by their disease-producing properties. In other words, the only way in which it would be possible to prove that any diseased material derived from the skin of the inoculated animal was pleuro-pneumonic would be by showing experimentally that when introduced into another animal it produced pleuro-pneumonia. If this proof were given we should have a right to conclude from analogy with similar cases, that in all probability immunity would be conferred on the infected animal; but in the absence of such proof, the only way in which the protective power of inoculation can be settled for practical purposes, is by observing whether inoculated animals can get pleuro-pneumonia by exposure.

The experiments which had previously been made for this purpose were unquestionably in favour of the protective power of inoculation. The inquiries of the French Commission, carried out in 1851, in which fifty-four animals were experimented upon at an expense of 2400*l.*, led to the conclusion that "inoculation possesses a preservative power conferring on the inoculated animal an immunity which protects it from the contagion of the disease for a time which remained undetermined," inasmuch as the experiments could not be continued for more than six months. This conclusion, founded on experiments which were evidently conducted with the utmost care and impartiality, has been largely confirmed by the trials which have been made of the practice by owners of stock in this and other countries, and particularly in our Australian colonies. It appears from a recent Government Report, that in the colony of New South Wales the practice of inoculation has been so successful as a preventive that it has become general; so much so, that the chief inspector of the colony was prepared in 1876, to recommend to the colonial government that it should be made compulsory.

But the proof of the protective power of inoculation, even if it were much stronger than it is, would afford an insufficient

reason for recommending it as a practice, unless it can be shown that the third question—that which relates to the risk of the operation itself—admits of a satisfactory answer. On the ground of its danger the French Commission, notwithstanding their opinion as to its protective power, declined to recommend it as an economically advantageous practice; for they considered that their own experiments showed "that inoculation causes a larger mortality than the disease which it is intended to prevent." No less than 11 per cent. of their animals had died, whereas it was extremely improbable that so large a number would have been sacrificed had they been subjected without inoculation to the ordinary risks of infection. Notwithstanding these facts, the Commission, of which M. Bouley was the Secretary, recommended that it ought to be encouraged on the ground that, its protective power having been demonstrated, the dangers above referred to would be diminished by improved methods.

Inoculation is usually performed by inserting the liquid which drains from diseased lungs into the cellular tissue. The situation chosen for the purpose is the end of the tail. The reason why this part is selected is, that if, as often happens, the local inflammation becomes excessive, it may be limited by amputation. But notwithstanding this safeguard, the diseased action is apt to spread to the neighbouring parts, in which case it occasions serious illness and often death.

The position of the question was therefore clear. The protective power of inoculation, though by no means definitively settled, had been rendered sufficiently probable to justify a more extended trial than it had as yet received. But the effects of the operation as hitherto practised were sometimes so severe that it appeared probable that the risk would more than cover the advantage.

One of the first objects which we had in view in our experiments was to test the possibility of communicating pleuro-pneumonia by mediate contagion. The lungs of animals which had been slaughtered in an advanced state of the disease (see Appendix I.) were placed, in the fresh state, under the noses of ten healthy animals of all ages. As none were infected, it did not seem necessary to repeat the trials in a systematic manner, the more so as the persons who attended on the animals were in the habit of handling the diseased organs which were at that time frequently brought to the Institution for pathological examination.

The experiments on inoculation were commenced in September in 1876. The first practical question which required an answer was whether it was possible by taking extra precautions in the

collection of liquid, and particularly by using it only in an absolutely fresh state, to avoid the inflammatory results which have been above described. Five animals were inoculated with perfectly fresh material from a cow killed the same morning (see Appendix II.). A few drops of the clear exudation-liquid from the lungs were injected under the skin either of the shoulder or of the side of the neck. For five days the animals remained well; on the sixth day a swelling appeared at the puncture, which gradually increased. In three of the cases it began to subside a week after it had commenced, and eventually disappeared; but in the other two it went on increasing until it had involved the integument of the neck, chest, and belly, at length causing death by general infection, in the one case on the twelfth, in the other on the fifteenth day of the illness. It is to be noticed that the animals exhibited no loss of appetite, nor any other sign of general disturbance, until the third or fourth day after the swelling appeared, nor did the temperature begin to rise in any instance until that time (see Appendix II.). In the two fatal cases the highest temperature, four and a half degrees above the natural standard (106·4 Fahr.), was reached three days before death.

The mode of progress of the illness indicated very distinctly that, although we had not communicated pleuro-pneumonia by our inoculations, we had introduced an infection of another kind. If the liquid injected had been a mere irritant it would, if its action had been intense enough, have produced a limited abscess, not a rapidly-spreading and diffuse infiltration. That this was so was confirmed by the appearances observed after death. The internal organs, and in particular the lungs, were found to be perfectly healthy; but the serous membranes exhibited the appearances ordinarily observed in animals that have died of acute general infection, that is, from what is popularly called blood-poisoning.

In the cases I have related, the effects of inoculation were, as has been seen, severe in every instance; for even in the three animals that recovered, the disturbance of health, as indicated by the high temperature and general state of the animal, was considerable. When the tail is selected as the seat of inoculation the case is much more manageable. Here, as before, it is not until the fourth or fifth day that the seat of puncture becomes painful and swollen. The swelling continues for about a week, by which time a slough of dead tissue has usually formed, which eventually separates. About the time that the slough comes away secondary swelling usually begins, and gradually extends to a greater or less distance towards the root of the tail, until, in unfavourable cases, the neighbouring integument is involved,

becoming the seat of diffuse cellular infiltration of the same kind as that which has already been described. In the ordinary case, a common result of tail inoculation is that part of the organ separates by necrosis, an event which is often not attended with any serious disturbance of the animal's health (see Appendix III.).

There are two reasons why inoculation, as practised in the above instances, is necessarily attended with danger. One of these is that the liquid used, however carefully it is collected, not only contains the virus of pleuro-pneumonia, but possesses morbific properties of another kind, which are due to its being the product of an unhealthy, or, as it is often called, an infective inflammation—properties which would have manifested themselves if, instead of the juice of a pleuro-pneumonia lung, we had used any other exudation-liquid of a similarly infective character. A second source of danger is, that the living tissue which serves as the channel of introduction is one which we know to be particularly susceptible to infective influences of this kind. By previous experiments, relating to another inquiry, we had found that this second danger could be avoided by infusing the morbific liquid directly into the circulation. We therefore resolved to adopt this plan, feeling sure that, if the pleuro-pneumonic virus possessed any protective power at all, that power would be exercised to the greatest advantage if the liquid were mixed with the circulating blood; for in this way it would necessarily come into contact, not merely with any particular part, but with every organ in the body. Another advantage which the method of infusion into the blood-stream offered was, that from fifty to a hundred times the quantity of liquid could be introduced at once, and thus the chance of infection be vastly increased.

Fourteen animals were thus inoculated (see Appendix IV.). The instrument employed was a syringe, capable of containing two drachms of virus, and furnished with a slender, sharp-pointed steel tube. The point was made to enter the principal vein by which blood returns from the back of the ear, and was usually secured by a ligature. The syringe was then slowly discharged, the greatest care being taken to avoid contact with the cellular tissue. It was often unnecessary to divide the skin. The whole operation was conducted without any appreciable suffering to the animal.

In the first batch of eight animals the operation was, in all but one, performed twice in each case, at an interval of several weeks, with a view to greater certainty of result. With the exception of a small prominence which marked the seat of the inoculation, and subsided in a few days, it was in general

followed by no morbid effects, either local or constitutional. In one instance, however, that of an old cow, unfavourable symptoms presented themselves on the sixteenth day after the infusion. On that day the bodily temperature, which at the time had been natural and had until then continued so, rose to 103·2° Fahr., and on the day following to 105·6°. At this point it remained until the twenty-second day, after which it declined till death, which occurred two days later. The rise of temperature was attended with other signs of fever, and with difficult breathing, which continued to the last. The post-mortem examination revealed that the cause of death was an acute double pleurisy; but in addition to this there were appearances which showed that the animal, which was thirteen years old, had suffered from chronic lung disease of very old standing. This, although not the immediate, was the predisposing cause of death. The immediate cause was, I have no doubt, the infusion, which, acting on the pre-existing disease, occasioned consequences to which a healthy animal would not have been exposed. It is perhaps desirable to add that the affection of the pleura from which this animal suffered, although properly called a pleurisy, was of an entirely different kind from the pleurisy which forms part of pleuro-pneumonia. The sub-pleural tissue, which in the contagious disease is the principal seat of alteration, was in this animal entirely unaffected; nor were any of those characteristic changes in the lung tissue observed which have been so well described by Mr. Yeo in this Journal. We are therefore justified in concluding that, whatever may have been its antecedents, it was free from pleuro-pneumonia during the time that it was under observation.

The remaining seven animals were, as has been already reported to the Society, exposed to the infection of pleuro-pneumonia in the most effectual manner that could be devised. They were removed from the Brown Institution, and placed in sheds which were at the time occupied by diseased animals, and in stalls in which such animals had stood. They remained under these conditions for three months, and in some instances for four, after which they were kept under observation for periods which in the majority of the cases extended to six months. None of them showed any signs of infection. In those that were slaughtered (see Appendix V.) the lungs and other internal organs were found to be perfectly healthy.

The other six animals were inoculated early in the present year; but in consequence, first of our being unable to meet with cases of pleuro-pneumonia in situations convenient for our purpose, and subsequently of the obstacles imposed by legislation, all attempts to test the immunity of these animals in

an effectual manner proved unavailing; and I found myself obliged to recommend to the Committee that they should be sold.

The results of the experiments have been so far satisfactory that I cannot help regretting that they have been brought to an abrupt termination. The smallness of the number of the animals which we have had the opportunity of experimenting on renders it impossible to regard them as conclusive. The utmost that can be said is that, so far as they have gone, the results are sufficiently favourable to justify us in recommending further trial of the practice of venous infusion to those who are unlucky enough to have their herds invaded by pleuro-pneumonia. As regards the safety of the operation itself, I can speak with confidence. Provided that an operator can be found with sufficient dexterity to perform it, and sufficient conscientiousness to avoid the known sources of danger, the trial can be made without risk. Certainty as to its value can only be attained by the experience of some years.

I cannot conclude this Report without pointing out that, in case the value of inoculation should be established, there is no reason why the measures of sanitary police which have been enforced by the Legislature should interfere with its useful employment. It has been distinctly recognised as the basis of this legislation that pleuro-pneumonia is a disease of extremely long incubation—*i.e.* one which may exist and progress in the organism for months without producing obvious symptoms; and that it is chiefly communicable by actual cohabitation. The recognition of these two facts has been embodied in the principle of *prolonged segregation of all animals that have been exposed to intercourse with living sources of contagion.* If it is found possible to carry out this principle effectually throughout the United Kingdom, it may be confidently anticipated that the prevalence of pleuro-pneumonia will gradually diminish until, as may be hoped, it may eventually disappear. The realisation of this desirable result would, no doubt, tend to diminish the importance of the question of inoculation. So long, however, as outbreaks of pleuro-pneumonia still exist, the limitation of its areas of prevalence by restrictive regulations would, in my judgment, materially facilitate the application, within the areas so limited, of whatever other means of prevention might be found to be effectual for the diminution of the number of animals attacked.

APPENDICES.

I. Exposure of animals to emanations from diseased organs.
II. Subcutaneous injection of pleuro-pneumonia exudation-liquid.
III. Inoculation in the tail by the ordinary method.
IV. Fatal case of "blood poisoning" apparently consequent on infusion of pleuro-pneumonia liquid into the circulating blood.
V. Inoculations by infusion into the veins.
VI. List of animals experimented upon.

APPENDIX I.

Exposure of Animals to the Emanation from diseased organs.

Sept. 9, 1876.—Portions of lung from a cow affected with pleuro-pneumonia were conveyed direct from a slaughter-house to the Brown Institution, and while still warm were placed in the mangers of two two-year-old bullocks, known as animals Nos. 3 and 4 in this Report. The diseased material was allowed to remain in the mangers during the night, and removed in the morning along with a considerable amount of serous fluid which had drained from it. No washing or disinfection was done after its removal. Both these animals were kept under close observation, and no result of this exposure was observed, and no rise of temperature was recorded.

March 27, 1877.—The above experiment was repeated by placing portions of diseased lung in the mangers of a cow, about six years old, and a two-year-old bullock, known as animals Nos. 2 and 5 in this Report. In this experiment the portions of lung were allowed to remain for twenty-four hours, and when removed the mangers were neither washed nor disinfected. It should be noted that in the case of No. 5 he had barely recovered from an attack of foot-and-mouth disease, communicated by means of saliva obtained from diseased animals at the Metropolitan Cattle Market. Neither of these animals was affected by this contact with the pleuro-pneumonia virus, and the daily recorded temperature remained normal.

August 16, 1878.—A favourable opportunity presented itself for repeating this experiment on a larger scale, when portions of fresh diseased lungs were placed in the mangers of seven animals, two cows and five yearlings, known as animals Nos. 10 to 15 in this Report; these animals did not suffer from an exposure of twenty-four hours to these diseased organs.

APPENDIX II.

Injection of Pleuro-Pneumonia Exudation-liquid into the Cellular Tissue.

September 6, 1878.—Five yearling heifers which had been kept under daily observation at the Brown Institution since March, and had been the subjects of experiments on anthrax, were inoculated by the injection of a few drops of the liquid obtained from a portion of diseased lung (taken from a cow slaughtered the same morning) into the subcutaneous cellular tissue on the side of the neck and front of the shoulder.

The punctures could be felt as mere prominences on the following day, and continued so in all the animals for four days. On the fifth day, in one there was some swelling and tenderness at the seat of puncture, and on the following day a similar appearance was observed in another. The daily record kept will best show the progress and the result of this swelling.

Sept. 11, 1878.—At the seat of puncture in No. 14, there is a little doughy painful swelling.

Sept. 12.—Swelling increasing in No. 14, and just beginning in No. 10.

Sept. 13.—Swelling still increasing in Nos. 10 and 14, temperature normal in all, and no evidence of constitutional disturbance in the two that show local symptoms.

Sept. 14.—Indication of slight swelling in Nos. 11, 12, and 13; in Nos. 10 and 14 the swelling is spreading, the temperature of No. 14, 102·9, in the others still normal.

Sept. 15.—Increase of swelling in all, but most marked in No. 14.

Sept. 15.—No. 10. 102·6.	*Sept.* 16.—No. 10. 102·2.
„ 11. 102·4.	„ 11. 102·6.
„ 12. 102·8.	„ 12. 102·8.
„ 13. 102·4.	„ 13. 102·2.
„ 14. 103·4.	„ 14. 104·2.

Sept. 16.—The swelling in the case of No. 14 increasing rapidly, very tender, doughy, and pits on pressure.

Sept. 17.—No. 10. 103·2. Swelling extends along one side of neck.
„ No. 11. 102·9. Swelling about the size of an egg.
„ No. 12. 103·6. Swelling about 6 inches in diameter.
„ No. 13. 102·6. Swelling as large as an egg.
„ No. 14. 105·4. The swelling now extends along both sides of the neck, animal ill, and refuses food.

Sept. 18.—No. 10. 104·2. The swelling is still confined to one side of neck.
„ No. 11. 101·9.
„ No. 12. 103·9. Swelling still spreading.
„ No. 13. 102·0.
„ No. 14. 106·0. At the seat of inoculation the skin is soft and moist, but there is no softening of the swelling generally.

Sept. 19.—No. 10. 104·3. The swelling is now extending along on both sides of the neck.
„ No. 11. 102·2.
„ No. 12. 104·0. The infiltration of the cellular tissue still progressing.
„ No. 13. 101·9. Swelling not increasing.
„ No. 14. 106·4. Constitutional disturbance great, the œdematous swelling now extends from the head along the whole under surface of the neck to the sternum.

Sept. 20.—No. 10. 105·0. The infiltration spreading rapidly.
„ No. 11. 102·0. The progress of the œdema now seems arrested.
„ No. 12. 104·0. The swelling involves nearly the whole of one side of the neck.
„ No. 13. 102·0. Swelling does not increase.
„ No. 14. 106·4. Animal getting weak, losing flesh rapidly; the swelling spreading down both fore-legs, but more particularly the left, the inoculation having been performed on that side. When some incisions were made into the swollen cellular tissue a quantity of serous fluid drained away. On cooling, this liquid became of a gelatinous consistence, and a soft clot separated. Under the microscope few red blood globules and great numbers of large granular cells were seen, but no bacteria or allied organisms could be made out.

Sept. 21.—No. 10. 105·8. The swelling is still advancing, and the animal refuses food, and is losing condition. A few incisions made to relieve the tension if possible.
„ No. 11. 102·0.
„ No. 12. 104·0. Swelling very tender.
„ No. 13. 102·0.
„ No. 14. 105·6. Very weak, lies almost constantly, the incisions

discharging freely, but the swelling spreading under chest and along the belly, skin sloughing where it was scarified.

Sept. 22.—No. 10. 105·8. The infiltration of the cellular tissue extending down the fore-legs as well as along the whole under surface of neck.

„ No. 11. 102·2. Swelling subsiding.

„ No. 12. 104·5. The swelling still confined to the side of the neck on which the puncture was made. A few small punctures made in the skin with a lancet.

„ No. 13. 102·6.

„ No. 14. 103·0. Can scarcely stand, sloughing condition of the skin, with fœtid discharge.

Sept. 23.—No. 10. 106·4. Very weak, and the incisions in the skin assuming an unhealthy appearance.

„ No. 11. 102·0. Swelling subsiding.

„ No. 12. 103·8. Swelling less tense, but wounds unhealthy.

„ No. 13. 101·8. Swelling subsiding.

„ No. 14. 100·2. Died in the course of the day. Post-mortem same night. A large quantity of straw-coloured gelatinous exudation in the subcutaneous cellular tissue, extending from the lower jaw along the inferior aspect of the neck, chest, and abdomen, and also extending down both fore-legs below the knee. In some places the exudation was nearly an inch in thickness, and when cut it yielded a pale straw-coloured juice. There was a small quantity of exudation in the peritoneal cavity, but the abdominal viscera were otherwise healthy. On the pleura and pericardium there were some hæmorrhagic spots as well as on the surface of the lungs, which were otherwise healthy.

Sept. 24.—No. 10. 106·4. Wounds sloughing and weakness progressing.

„ No. 11. 101·8.

„ No. 12. 104·0. The swelling now subsiding.

„ No. 13. 102·0.

Sept. 25.—No. 10. 105·8 The swelling extending along the belly, animal sinking.

„ No. 11. 101·8. Very little swelling now remains.

„ No. 12. 103·0. Swelling subsiding, fluid still draining freely from the wounds, which are of a very unhealthy character.

„ No. 13. 101·8. The swelling has almost disappeared.

Sept. 26.—No. 10. 104·0. Lies constantly, can scarcely get up, evidently sinking.

„ No. 11. 101·8.

„ No. 12. 103·2. Swelling much reduced, a fœtid discharge continues from the wounds.

Sept. 27.—No. 10. 102·3. Unable to stand; slaughtered; post-mortem immediately. With the exception of a few hæmorrhagic spots on the peritoneum, the abdominal viscera were healthy. Pleura studded with hæmorrhagic spots, and contained a small quantity of exudation. Lungs perfectly healthy.

In this case the swelling extended from the lower jaw along the under surface of the neck and body to the mammary gland, and down both fore-legs as far as the fetlock joints.

Sept. 28.—No. 12. 102·0. Swelling fast disappearing.

Sept. 30. No. 12. 101·8. Wounds healing, and swelling almost gone.

APPENDIX III.

Inoculation in the Tail by the ordinary Method.

A healthy cow, about six years old, which had been kept under daily observation for several months, and had on three occasions during the month of June, 1876, resisted infection with foot-and-mouth disease, calved on August 15, 1876, and for a few days both before and after calving an increase in the bodily temperature was noted. As determined by a long series of observations, the mean normal temperature was 101·6 Fahr., the range of readings being from 101 to 102·2.

Nov. 3, 1876.—About two drops of the fluid which had drained from a diseased lung were injected into the cellular tissue of the tail about 3 inches above its termination. For the first four days the seat of the puncture could be felt as a very small prominence, but on the fifth day it was tender and slightly swollen. The swelling slowly increased up to the 10th day, and was at that date confined to the seat of puncture, and about 1½ inch in diameter.

On the 12th day a slough had formed in the centre of this swelling, which separated on the 17th day, and left an ill-conditioned sore.

A much more extensive secondary swelling now began, involving the whole circumference of the lower part of the tail, and spread gradually upward for 9 inches above the seat of the inoculation by the 33rd day. At this time about 12 inches of the lower part of the tail was twice its natural thickness. This swelling was firm, cold and painless, except at its upper margin, where it terminated somewhat abruptly in a narrow band, where the skin was hot and tender, and, at which point by the 38th, softening began, and the future line of separation was marked out. The dead portion of the tail gradually shrivelled, and finally separated without hæmorrhage on January 3, 1877, the 58th day after inoculation. Under ordinary circumstances the dead portion of the tail would have been amputated long before, but in this case the sequel to the inoculation was watched without interference.

While these changes were taking place at the seat of inoculation the animal showed no signs of constitutional disturbance; the mean temperature during the 58 days was 101·64, and the daily readings ranged from 101·2 to 102·2. No suppuration attended this sloughing, and the small raw surface on the end of the stump healed in a few days.

This animal was afterwards placed in a cow-shed where pleuro-pneumonia existed on November 23, 1877, and kept there until January 9, 1878, when, being so ill that there was little prospect of recovery, she was slaughtered. A post-mortem examination showed that the illness of this animal was due to the presence of a large surgical needle which had been swallowed with the food, and having transfixed the wall of the second stomach had injured the liver and diaphragm, causing a large diaphragmatic abscess; in addition, the liver was extensively diseased and contained a large number of parasites. The lungs and pleura were perfectly healthy. No trace of any adhesions or sub-pleural exudation.

APPENDIX IV.

Fatal case of "Blood poisoning," apparently consequent upon the injection into the circulating blood of Pleuro-Pneumonia Virus.

A cow supposed to be about thirteen years old had been kept under daily observation at the Brown Institution for eight months. In June, 1876, she

resisted infection with foot-and-mouth disease on four occasions. With the exception of a cough (which was mostly heard in the morning or when disturbed after she had been lying for some time), she appeared in good health. The mean normal temperature obtained by daily observations extending over several months was 100·8° Fahr., the range of the readings being from 100·1 to 101·7.

About the middle of November for several days the temperature rose without any apparent cause, and again declined to the normal; no other change in the animal's condition was noted. During the first 12 days of November the highest recorded temperature, that on the 12th, was 102·2, and the lowest, on the 10th, 101·2.

The daily record was as follows:—

Nov. 12.—102·2	*Nov.* 15.—103·8
„ 13.—103·4	„ 16.—102·4
„ 14.—104·0	„ 17.—102·0

The temperature continued normal during the remainder of this month and the early part of December.

Dec. 12, 1876.—Three fluid drachms of the exudation-liquid from pleuro-pneumonia lung were injected into the posterior auricular vein.

Little local effect was produced for the first 15 days; the animal showed no constitutional disturbance, the temperature being 101·73 Fahr., and the highest 102° Fahr.

Dec. 28.—The 16th day the temperature rose to 103·2, but no other symptom was observed; the pulse and respiration remained normal, and the cow fed and ruminated as usual.

Dec. 29.—Still feeding and ruminating, but appears ill, breathing difficult and irregular, 30 per minute, pulse 60, temperature 105·6. Stands with head elevated and nose protruded, evinces no signs of pain when the intercostal spaces are pressed.

Dec. 30.—Dull and prostrate, not feeding, constipation with mucous coating of fæces; respirations 32, pulse 70, temperature 105·4. When moved, she grunts and shows some indication of pain when the intercostal spaces are pressed. Auscultation does not reveal any lung consolidation.

Dec. 31—In same prostrate condition as yesterday, neither feeding nor ruminating, respirations 30, pulse 68, temperature 105·2.

January 1, 1877.—Prostration increasing, losing condition rapidly, respiration 32, pulse 64, temperature 105·6.

Jan. 2.—Respirations 36, pulse 70, weak, and temperature 105·6.

Jan. 3, 9 A.M.—Respiration 60, and accompanied by a grunt, which proved, on examination, to be due to the closure of the glottis after each inspiration, the pulse was indistinct in the superficial vessels; temperature 104·8. At 3 P.M. on the same day the temperature had fallen to 104, and by 9 P.M. to 102·8 —2° in twelve hours.

Jan. 4.—Lying, and unable to get up, breathing heavily, grunting, shivering, and grating her teeth; respirations 82, pulse imperceptible, temperature 101·6 in the morning, and only 100·4 at 10 P.M., when the animal was evidently sinking.

Jan. 5.—Died about 7 A.M. Post-mortem 8 hours after death. With the exception of a small blood-clot under the capsule of the liver, the whole of the abdominal viscera were healthy; this small clot was recent, and probably due to a slight rupture in some of the animal's struggles to get up.

The costal pleura on both sides showed numerous patches of recent exudation, the vicinity of which was studded with small hæmorrhagic spots, the surfaces of both lungs were smooth, and free from any adhesions to the sides of the chest, and from sub-pleural exudation, although on the surface of both there were some hæmorrhagic patches. The right lung, from the animal having died on that

side, was dark-coloured and full of blood, but its tissue was healthy and crepitant throughout. Along the thin margin of the middle part of the left lung there existed a patch of partially consolidated tissue, about three or four inches in extent. The firm straw-coloured exudation, which was confined to interlobular tissue, not invading the lobules themselves, varied in thickness from $\frac{1}{16}$ to $\frac{1}{8}$ inch. When cut, no juice exuded from the surface, such as is always seen in cases of acute contagious pleuro-pneumonia.

The whole appearances showed conclusively that this exudation was not the result of any recent inflammatory action, but some old morbid process in the interlobular tissue.

In addition, about the middle of the superior aspect of the left lung, there existed a cavity bounded by a strong resisting membrane containing a mass of dead lung, the remains of the interlobular tissue being easily made out under the microscope. This piece of necrosed lung was as large as an egg, and was infiltrated and partially surrounded by cheesy material.

Such cavities, containing portions of dead-lung tissue, have frequently been met with in the lungs of cattle which have recovered from limited or partial attacks of pleuro-pneumonia.

Professor Brown, in the Annual Report of the Veterinary Department of the Privy Council for 1876, at pp. 18, 19, describes a case of this kind where the animal was slaughtered eleven months after recovery.

The French Commission, in reporting the results of their experiments in 1854, stated that in six out of eleven uninoculated animals that had been exposed to the influence of contagion by three months' cohabitation with diseased animals without apparent result, they found portions of dead lung encysted. This would go far to show that these six animals had been the subjects of limited attacks of the disease.

APPENDIX V.

Inoculation by the infusion of Pleuro-Pneumonia Virus into the blood.

In performing inoculation by this method, the vein running down the back of the ear was selected on account of its moderate size and superficial position.

The vein was exposed by a small incision in the skin, and the sharp-pointed steel cannula of a subcutaneous syringe introduced into the vein, and the fluid obtained from the diseased lung slowly passed into the blood-stream by the syringe. The vein was afterwards secured by a ligature, and the small wound in the skin closed by a suture. In the first attempts at inoculation by this method, it was found that the ligature of the vein and the suture in the skin caused some swelling which did not subside in less than fourteen days. It was also seen that by making an incision in the skin, the risk of introducing the virus into the cellular tissue, which has since been proved to be extremely dangerous, was very much increased. It was afterwards found that, with the exception of one case in which the vein was very small, in a calf about two months old, the incision in the skin could be dispensed with. By shaving the hair off the spot selected for the operation and applying pressure so as to cause the distention of the vein by blood it could be distinctly seen, and a fine-pointed steel cannula passed into it in the direction of the blood-stream. That the cannula was in the vein itself, and not merely lodged in the sheath or surrounding cellular tissue was readily demonstrated by allowing a few drops of blood to flow before attempting to inject the virus. By this means the risk of inoculating the cellular tissue was reduced to a minimum if not entirely avoided. The application of slight pressure over the vein for a few seconds after the with-

drawal of the cannula was found sufficient to stop any slight bleeding from the puncture, and thus the trouble and danger of applying a ligature to the vein was found unnecessary.

Sept. 9, 1876.—The animals, known in this Report as Nos. 5, 6, 7 and 8 (see Appendix VI.), had been under daily observation at the Brown Institution for three months, and during the whole of that time had remained perfectly healthy, as is shown by the following temperatures:—

	Highest.		Lowest.		Mean.
No. 5.—	102·6	..	101·45	..	101·65
„ 6.—	102·6	..	100·4	..	101·55
„ 7.—	102·8	..	101·1	..	101·95
„ 8.—	102·6	..	101·2	..	101·9

The inoculation was performed by injecting two fluid-drachms of fresh pleuro-pneumonia exudation into the vein. The only local effect observed was a little swelling of the wound, which disappeared, leaving only the cicatrix of the incision by the fourteenth day.

No constitutional disturbance followed this injection of the virus into the blood; the daily temperature of all the animals continued normal, as is shown by the following Table, the results of forty daily observations of each animal:—

	Highest.		Lowest.		Mean.
No. 5.—	102·6	..	101·4	..	101·65
„ 6.—	102·2	..	101·3	..	101·71
„ 7.—	102·9	..	100·7	..	101·8
„ 8.—	102·4	..	101·0	..	101·7

Nov. 3, 1876.—Some of the fluid collected for the inoculation of No. 2 in the cellular tissue of the tail was used for infusion into the vein in animals Nos. 3, 4 and 9 (see Appendix VI.). The animals Nos. 3 and 4 had been exposed to contact with portions of diseased lung on Sept. 9, but the daily temperature recorded commencing in June, shows that they had been healthy during the whole time:—

	Highest.		Lowest.		Mean.
No. 3.—	101·9	..	101·1	..	101·29
„ 4.—	102·0	..	100·0	..	101·15

In the case of No. 9, the animal was barely three months old, and the normal temperature, as the mean of twenty daily observations, was found to be 102·2.

The local effect produced by the injection into the vein was only slight in Nos. 3 and 4, and the wounds had closed and all swelling disappeared in from twelve to sixteen days. In the case of No. 9 the vein was so small that even when fully exposed some difficulty was found in introducing the cannula. Although no infiltration of the surrounding cellular tissue resulted from the injury inflicted, an abscess about the size of a pigeon's egg formed, and the wound was not closed until the twenty-third day after the inoculation, but no secondary swelling appeared, and no general disturbance was observed in any of these animals, even although the quantity of fluid injected was three fluid drachms. As proof of this, the result of the daily temperature observations, during the forty days immediately succeeding the operation, may be quoted:—

	Highest.		Lowest.		Average.
No. 3.—	102·4	..	101·2	..	101·7
„ 4.—	102·0	..	101·2	..	101·6
„ 9.—	102·8	..	101·9	..	102·21

Dec. 12, 1876.—A portion of the material used for the inoculation of the cow No. 1, referred to in Appendix IV., was used for the second inoculation of

Nos. 3, 4, 5 and 6. The operation was this time performed without making an incision in the skin. The local effect produced by the puncture was only a very slight prominence, which could be felt for a few days.

The quantity of fluid injected was again three drachms.

No constitutional effects were visible, as the result of this inoculation, although the animals were under observation for some months, as will be seen by reference to Appendix VI.

They were afterwards submitted to contact with diseased animals, and were kept in infected places, to test, as far as practicable, the protective value of the inoculation. The animals Nos. 3 and 4 were slaughtered March 1st, 1878, after a test exposure in an infected shed in November and December, 1877. A post-mortem examination was made, and the lungs of both were found in every respect healthy. Animal No. 5 was infected with foot-and-mouth disease in March, 1877, and was placed in a shed infected with pleuro-pneumonia, in November, 1877, and continued healthy up to the end of March, 1878, when he was disposed of. No. 6 was placed among infected stock, July, 1877; was brought back to the Brown Institution in February, 1878, when he was made the subject of a test experiment relating to the communication of anthrax by feeding.

March 27, 1877.—Animals Nos. 7, 8 and 9 were a second time inoculated by injecting into the veins three drachms of pleuro-pneumonia virus.

Since their previous inoculation on September 9, 1876, Nos. 7 and 8 had been castrated in November, the result of which operation was to cause an increase of temperature for a few days. They had also been affected with foot-and-mouth disease in February, 1877, induced by eating hay moistened with the saliva of diseased animals.

As the result of this pleuro-pneumonia inoculation, no general effect was produced; they were all kept at the Brown Institution till July, and then placed along with No. 6 among diseased stock, and brought back to the Brown Institution, for experiments on the production of anthrax in February, 1878. Nos. 7 and 8 were afterwards sold at the end of March, but No. 9, for which another animal was obtained in exchange, remained at the Brown Institution in a healthy condition till the middle of May.

September 2, 1878.—The five yearlings referred to in Appendix II. were inoculated by the injection of two drachms of pleuro-pneumonia virus into the vein. At the seat of puncture a mere prominence could be felt, which had quite subsided by the 6th, when the subcutaneous injection was performed. These animals had been the subjects of anthrax experiments in May and June, but their temperatures had remained normal from the middle of July, and continued so until after the subcutaneous inoculation on September 6. As no opportunity was found for placing these animals in infected sheds, they were finally sold in a healthy condition in November.

September 6, 1878.—Two cows, which had been under almost daily observation at the Brown Institution during May, June, and July, while the subject of vaccination observations, not connected with the work of the Royal Agricultural Society, were purchased for pleuro-pneumonia experiments. Some of the pleuro-pneumonia virus used for the subcutaneous inoculation of the five yearlings, Nos. 10 to 14, was injected into the vein of these two cows. No result was observed further than a mere prominence at the seat of puncture, which could be felt for a few days.

As these could not be placed in infected places, they were disposed of as healthy in the beginning of November.

APPENDIX VI.

Number.	Description of Animal.	Date of Purchase.	Date of Inoculation.	Date of Commencement of Period of Exposure.	Date at which Animal Died or was disposed of.
1	Cow, 13 years old ..	March 23, 1876	Dec. 12, 1876	..	Died, Jan. 5, 1877.
2	Cow, 6 years old ..	,, 25, ,,	Nov. 3, 1876	Nov. 23, 1877 ..	Slaughtered, Jan. 9, 1878.
3	Bullock, 2 years old ..	April 28, 1876 ..	,, ,, and Dec. 12, 1876 ..	Nov. 14, ,, ..	Slaughtered, Mar. 1, 1878.
4	,, ,, ..	,, ,, ..	,, ,, ,, ,,	,, ,,	,, ,,
5	Bullock, 1 year old ..	,, ,, ..	Sept. 9, 1876 ,, ,,	Nov. 23, ,,	Sold, March 22, 1878.
6	,, ,, ..	,, ,, ..	,, ,, ,, ,,	July 16, ,,	Sold, March 30, 1878.
7	Calf, 6 months old ..	,, ,, ..	,, ,, and March 27, 1877	,, ,,	,, ,,
8	,, ,, ..	,, ,, ..	,, ,, ,, ,,	,, ,,	,, ,,
9	Born at Brown Inst. ..	August 15, 1876	Nov. 3, 1876 ,, ,,	,, ,,	Exchanged, Mar. 30, 1878.
10	Heifer, 1 year old ..	March 30, 1878	Sept. 2, 1878, and Sept. 6, 1878 ..		Slaughtered, Sept. 27, 1878.
11	,, ,, ..	May 6, 1878 ..	,, ,, ,, ,,		Sold, Nov. 16, 1878.
12	,, ,, ..	,, ,, ..	,, ,, ,, ,,		,, ,,
13	,, ,, ..	,, ,, ..	,, ,, ,, ,,		,, ,,
14	,, ,, ..	,, ,, ..	,, ,, ,, ,,		Died, Sept. 23, 1878.
15	Cow, about 10 years old	August 15, 1878	Sept. 6, 1878		Sold, Nov. 1, 1878.
16	,, 6 years old	,, ,, ..	,, ,, ,, ,,		,, ,,

IX.—*The Agricultural Features of the Paris Exhibition.* By William Macdonald, Editor 'North British Agriculturist,' and James Macdonald, Agricultural Reporter, 'Scotsman.'

Introduction.

The great "World's Fair" which opened in the Champ-de-Mars, Paris, in May, and closed in November, has been a credit to the French authorities, whether a profit in a financial respect or not. It is beyond our province to report on the latter aspect of the gigantic undertaking; but it is our agreeable duty to record here the great success of the Exhibition from an agricultural, or, for that matter, industrial, point of view. In some respects the arrangements were admirable, though in others, as was to have been expected, they were not quite what an Englishman could have wished, or indeed was accustomed to see at his own national agricultural gatherings. It must be admitted, however, that the arrangements for the live-stock displays were, in some of their features, considered superior to anything that the ordinary British Show-goer has hitherto seen. We refer in particular to the design and workmanship of the buildings, which it may be stated had a semi-permanent character, and served first for the cattle display and afterwards for that of horses. Perhaps it should also be stated that expense was no object. The rows of shedding were roomy, airy, well-lighted, and very comfortable both for man and beast. The stalls were commodious, clean, and tidily kept.

It is not our purpose to dwell on the charms of the gay capital of France; on the extent and beauties of the Exhibition ground and buildings; on the facilities afforded to visitors by the various competing routes from England; nor on the extent to which the attractions of the Exhibition affected the revenue of railway companies and hotelkeepers in the different parts of Britain, more especially Scotland, frequented by tourists. We may refer, however, to certain circumstances which prevented a larger and better representation of British stock from putting in an appearance at Paris. In the first place, the journey was long and rough, and the risks of disease were great. These facts could not be ignored by the owners of very valuable Shorthorns, and the fears of this nature entertained at the outset proved only too well founded, for the most valuable animal that crossed the Channel succumbed to disease before she could regain her own pastures. Another thing that operated against the exhibition of cattle from the United Kingdom was the period

up to which the ages of the animals were reckoned—1st May, 1878. For this country, in which there is a pretty regular calving season—the spring months—the date of calculating ages could not have been more unsatisfactory. The two-year-olds had to compete among cows, and the class under two years on 1st May had to be made up chiefly of what is usually termed yearlings. Then the maximum age for bulls was four years on 1st May last. That still further limited British competition. There was no such limitation in the female classes, and we could see no reason for it in those for males.

The system of judging by large juries is also unpopular with British exhibitors of live stock, and is year by year getting more so. Again, there was little prospect that the body of jurors would include gentlemen familiar even with the main characteristics of the various British breeds. For example, we happen to know that but for this fear there would have been a good representation at Paris of the heavy-milking Ayrshire, the valuable grazing Polled Galloway, and the excellent beef-making Hereford. As it was, these breeds were almost, if not wholly, a blank. The grouping of various breeds rather awkwardly together in the original premium-list had also a deterring effect—more, however, in the sheep than the cattle classes. Those splendid mutton-makers, the Shropshire Downs, for instance, were conspicuous by their absence on this account; so were those valuable crossing sheep, the Border Leicesters. The former were linked with the Oxford and the Hampshire Downs, and the latter with English Leicesters, Lincolns, and some other Long-woolled breeds. Anything like satisfaction could not have resulted from so many different breeds competing together. Breeders were fully aware of this, and many who would otherwise have sent their stock kept them at home. That the jurors would succeed in getting prizes for the representatives of each of the distinct breeds could not have been foreseen months before by stock-owners, who, of course, had only the official premium-list to guide them.

While these circumstances unquestionably made the display of British live stock less representative, smaller, and generally not so creditable as it otherwise would have been, it cannot be said that this country has cause to complain, or to be ashamed of the result. England carried the "blue ribbon" of the Exhibition for sheep and swine, and Scotland that for cattle. For horses the champion prize was considered by British visitors to be more decidedly theirs than the cattle, sheep, or pig trophies were; but a different system of adjudication was adopted in the equine department, as will be afterwards explained, and the coveted honour was retained in France.

Agricultural implement-makers from Great Britain made a capital appearance—at great labour and expense, no doubt; yet they maintained their high reputation. In this department our American cousins not only pressed us hard, but in some points surpassed us. France and several other Continental countries have improved wonderfully since the last Paris Exhibition, in 1867. The improvements made in that comparatively short period, most notably perhaps in France, have not been confined to agricultural implements. They were rendered very evident in the live-stock sections of the Exhibition. Both cattle and sheep from the home country made a relatively better appearance than they have done at any of the previous International Exhibitions in the fashionable French capital. Agriculturally speaking, the Exhibition of 1878 showed France in a considerably advanced state from that in which it appeared even in 1867.

Live Stock.

The display of cattle, sheep, and swine opened on the 7th of June, and continued over twelve days. The official Catalogue contained 1700 entries of cattle, 825 of sheep, and 381 of swine —in all, 2906. A considerable number of the animals entered were not exhibited, but, on the other hand, the "entry" in numerous sheep and swine classes consisted of three or more animals, so that it may safely be stated that over 3000 animals were gathered together. The countries represented were France, Great Britain, Austria, Belgium, Denmark, Holland, Italy, Portugal, and Switzerland; those having the largest number of entries being France, Great Britain, Belgium, Holland, and Switzerland. Austria showed neither cattle nor swine, and was represented in the sheep department by two pens of the Zakkel and three of the Merino breed. Though it cannot be claimed that the display was complete as an exhibition of European cattle, sheep, and swine, still it is not too much to say that it was not only the largest and most valuable, but also the most varied and most interesting that has ever yet been opened to the eye of the public. In proof of this it will be sufficient to state that no fewer than 65 distinct races and sub-races of cattle, 50 races and sub-races of sheep, and 21 races and sub-races of swine were represented; and that in addition to all these the turn-out of cattle comprised specimens of over 30 different crosses, that of sheep about 20, and that of swine 25. What a panorama of form, colour, and characteristic! What a study for the student of agriculture! What a field for the curious and the inquiring! It has perhaps never had an equal; it has certainly never been surpassed. In those sixty-five varieties of the

bovine race there was room for contrast, room for numerous grades of development, room for animals, good, bad, and indifferent. Comparisons are sometimes odious; here they were often instructive, sometimes amusing. It was both tempting and entertaining to institute comparisons, to pass from class to class, and contrast one breed with another—the gay handsome Shorthorn with the light-waisted, low-loined, many-shaped, Pyrenean breeds; the sleek black Polls with the symmetrical white Charolais; the massive, powerful-looking Limousin with the tiny Kerry; the clumsy, thick-necked Swiss with the slim Fleming, the plump three-feet-high Breton with the tall blue Italian. Then among the fleecy and porcine tribes the contrasts were scarcely less amusing, and every whit as instructive. It may be explained that in each of the three departments there were two divisions, namely a "Foreign Division," open to nations other than France; and a "Home Division," confined to French exhibitors. We shall begin, as the Catalogue does, with the "Foreign Division," and, like it also, speak first of British cattle.

English Breeds.

Shorthorns.—Of this justly popular breed England and Ireland contributed 42 entries. Several of these, however, including the Irish, failed to put in an appearance. Both the classes of bulls were rather indifferently filled as regards quality. In neither of the male classes was the merit so high as one sees usually at an open show in this country. First and third in the younger bull class were a pair of moderate specimens from Flanders. Shorthorns from other countries foreign to France competed with English animals of the breed, but, except in this class, they made little of it. Lady Pigot—whose exhibits we have often seen in better bloom—got second worthily with "Nobilis," a nineteen-month-old roan, son of "Royal Commander," out of "Victoria Gloriosa," whose name indicates the tribe to which she belongs. "Nobilis," though thus very well bred, can hardly be called a bull of first-class Showyard form. He was bred by the exhibitor, and may improve with age.

The class of bulls between two and four years was rather better filled than the younger one. With a pair of good useful whites, England got first and second honours. Lady Pigot had here also to be contented with a second ticket. Her Ladyship's exhibit was "The Beau," a two-year-and-five-month bull, bred in the West Hall herd, after "Damon," now at Coulardbank, Morayshire, and out of "Mary Belle." "The Beau" is big for his age, with plenty of masculine character, and no lack of

substance, but deficient somewhat in shape and symmetry when you come to "take him to pieces." Still he pushed pretty closely on the first one, "Baron Australia Bates," a two-year-and-eight-month-old animal of Bates blood, shown and bred by Mr. George Fox, of Elmhurst Hall, Staffordshire. This bull was not all that could have been desired in a first-prize animal, though he is a strong, massive, useful-looking sire.

The female classes were decidedly superior to the male. In the class of heifers under two years, perhaps the best looking Shorthorn in the Exhibition appeared in the shape of the Marquis of Exeter's beautiful twenty-three-month-old roan "Sea Bird." This charming heifer, bred at Burghley, is a worthy daughter of that distinguished prize bull "Telemachus," and out of the valuable breeding cow "Sea Gull." "Sea Bird" has inherited from her sire rare quality and wealth of flesh, is very level all over, with wide ribs, strong loins, nice hair, much style, and attractive head and neck. Shown as she was in the best of trim, and having nearly all the advantage that the maximum age could give, she was an easy first in a good class. The well-known Booth and Knightley herd at Windsor furnished a creditable second in "Cawlina 9th," a seventeen-month-old roan, daughter of the Knightley cow "Cawlina 5th," and after Mr. Booth's "Manrico" (26,805). This heifer is long in the quarter, level in flesh, and handsome in form. She did not display so much substance and wealth of carcass as "Sea Bird" did, being younger; yet Her Majesty's exhibit showed much style and feminine character. She is the result of at least two crosses of Booth blood on Knightley. Those having experience of this cross would readily believe that she is not the produce of a first cross of this nature, because it is seldom that it appears in such good form. Second and subsequent crosses of Booth blood on the grand milking Knightleys produce excellent animals—generally nicer than those of the first cross. Lady Pigot and Mr. Fox had a hard pull for the third ticket. Eventually preference was given to Mr. Fox's tidy little roan, daughter of the celebrated American-bred "Duchess" bull, "24th Duke of Airdrie." She was only thirteen months old, had a good coat of hair, handled well, and looks like making a good cow, not having been overdone in the way of feeding. Lady Pigot's "May Queen," a seventeen-month-old roan, half-sister to "The Beau," and by her Ladyship's well-known bull "Red-Cross Knight," had more size and substance than the third heifer, with a truer outline; but the West Hall heifer did not prove so sweetly under the hand, nor display so much feminine character as the other. Lord Bective got a well-deserved "honourable mention" for a good red and

white twenty-one-month-old heifer of his Lordship's own breeding, viz., "Marchioness 11th," a daughter of the highly-bred "Duchess" bull "Duke of Underley," son of the 6300 guinea cow "10th Duchess of Geneva."

Five prizes, varying from 12*l.* to 24*l.*, having been offered for cows or heifers over two years old, good competition was secured. Here again Her Majesty the Queen and the Marquis of Exeter had the best of it; the Queen with the mother of the second yearling heifer and the Marquis with the half-sister of the first-prize heifer. Victory, however, was once more clearly on the Marquis's side. His beautiful four-year-and-five-month-old roan cow "Telemacina," sired by "Telemachus," and out of "Lady Penrhyn," by the "Duke of Wharfdale" (21619), whose name indicates that Bates blood is in her veins, was not to be denied. "Telemacina" is so well known to many of the English Show-goers that little need be said of her appearance on the banks of the Seine. She was really the only firm rival that her half-sister had for the distinction of being the best Showyard Shorthorn in the Exhibition. "Telemacina" has a grandly arched rib, good loin, nice shoulder, and good quality. Along the top she is faultless, and the deficiency which characterised her last year, when she was third at the Liverpool "Royal," viz., a little bareness below, is less visible than it was in 1877. If we mistake not, she is a better Shorthorn cow than any we have seen in the British Showyard this season. "Cawlina 5th," from Windsor, which was the second-prize two-year-old at the Aberdeen Highland Show in 1876, and was third at the Edinburgh Highland Show in 1877, made a capital second. Lengthy, heavy, and stylish, she proves well under the hand, is getting a trifle patchy, but is all over a handsome daughter of the late Mr. T. C. Booth's "King Tom" (31,521). Lady Pigot was stiffly in for the third ticket in this class also; she had nothing to say to it earlier. The Jurors hesitated a considerable time between her Ladyship's cows and Mr. Robert Bruce's "Miss Fox," from Manor House, Northallerton, and bred by Mr. Outhwaite. "Miss Fox" is a four-year-old white daughter of that remarkable nine-year-old bull, "Royal Windsor" (29,890), bred by Mr. Willis, and the winner of first honours at the Cardiff Royal and Kelso Highland Shows in 1872. This cow won the coveted ticket at the Edinburgh Highland Show in 1877, beating then "Cawlina 5th," now preferred without a murmur. To handle, "Miss Fox," since exported to New South Wales, is a little stiff, but her outline is good, her neck vein remarkably well filled, while she covers a great deal of ground in proportion to her apparent size. She was ultimately chosen for third honours, which was all that her plucky owner could have ex-

pected in such company. Lady Pigot's "Rosalba," a three-year-old red roan, of Mr. Richard Stratton's breeding, and fourth winner at Liverpool in 1877, had strong claims for higher honours in the estimation of an "all-round" sort of bench, being thick, massive, and, like all the Stratton Shorthorns, very well fleshed. At the tail, however, she is a little bumpy, and lacks the degree of Shorthorn character displayed by some of the other exhibits. With fourth place she had to be content. No exhibitor was permitted to take more than one prize in any class, so that her Ladyship's other cows —all more or less known to fame— had to be set aside when the destination of the fifth ticket was being settled. It fell to a fair two-year-old roan heifer, shown by Mr. J. B. Spence, Half-moon Street, Piccadilly. "Honourable Mention" was deservedly bestowed on Her Majesty the Queen's "Benedicta," by the recently deceased Warlaby sire, "Royal Benedict" (27,348); on Lady Pigot's "Zvezda," "Dainty Dame," and "Victoria Lucida;" on Lord Bective's "Red Rose of Teviot," a two-year-old thickly-fleshed heifer of the rising tribe indicated by her name; and on Mr. J. K. Fowler's "Gräfin Foggathorpe 8th," from Prebendal Farm, Aylesbury.

That the class of cows or heifers over two years was a good one may be readily inferred from the fact that it contained the third and fourth Royal winners of 1877, and the first and third Highland Society's prize-takers the same year. Lady Pigot's "Zvezda" was evidently past her bloom. Indeed, she has not been in good Showyard form since she suffered so severely from foot-and-mouth disease two years ago. Her grandly arched ribs, immense width of chest and splendid character were as attractive as ever, but her patchiness on the hind-quarters and unevenness along the top would not "go down" with the foreign Jurors and she only got "Honourable Mention," though she was the first-prize Royal and Bath and West yearling in 1875, was sired by the late Mr. T. C. Booth's "King James" (28,971), and was considered the most valuable Shorthorn, so far as pedigree was concerned, in the Exhibition. This is not all; she most unfortunately fell a victim to a second attack of foot-and-mouth disease, and died just at calving in the quarantine premises at Brown's Wharf, London, in the first week of July. Her Ladyship's loss by the death of this precious cow was heavy, and occasioned much regret in Shorthorn quarters; but it is not without its lessons. The career and early death of this very valuable animal should be instructive to the owners of cattle worth in the market "four figures." By subjecting such animals to the trying ordeal of preparation for a high place in the modern Showyard, unfortunately a very great risk is run. When she appeared for the first time in public at Croydon in

June 1875, at the top of the yearling class, she was as ripe apparently as a pear—as "hard fat" as a Smithfield beast. That displayed the natural aptitude of a well-bred Shorthorn to mature early, but it did not augur well for her future usefulness as a breeder and milker. The very hard life of a Showyard animal, with all its risks of disease, undoubtedly hastened her end. The more is the pity!

Herefords.—Four classes were arranged for this breed, and prizes were offered of the value of 4600 francs (about 184*l.*). But only two animals were entered—one by Her Majesty the Queen, and the other by Mr. Hewer, Marden, Hereford. The latter did not send his animal, so that the "white-faces" were represented by Her Majesty's three-year-and-five-month-old bull, got "Alexander," and out of "Caliope 2nd." He was a fair specimen of the breed, and well deserved the first premium of 800 francs, or 32*l.* It is much to be regretted, however, that some of the magnificent herds in the stronghold of the breed did not put in an appearance.

Devons and Sussex.—These two breeds were conjoined in competition; but, though similar in some points, they differ sufficiently to make such mixing of them undesirable and unsatisfactory. Both mustered in greater force than the Herefords, but still they were not such a large show as might have been expected, considering how strongly they usually congregate at Shows in their native country. Together they numbered only about a dozen. In regard to merit, however, both breeds made a good appearance. In the class for bulls under two years old, Mr. Walter Farthing, Stowey Court, Bridgwater, Somerset, well known as one of the most successful breeders of Devon cattle, came first, getting 800 francs (32*l.*) with a handsome one-year-and-ten-month-old bull, "Cherry's Duke," got by "Croydon Boy" and out of "Cherry 3rd" (2572). The second prize 700 francs (28*l.*) fell to a good specimen of the Sussex breed, shown by Messrs. E. and A. Stanford, Ashurst, Steyning, Sussex, aged one year and nine months. In the old bull class the same exhibitors stood alone, but in this case the Sussex breed turned the tables on its friendly opponent, the Messrs. Stanford getting the 800, and Mr. Farthing the 700 francs. Perhaps the best class in this section was that for heifers under two years of age. A very neat, plump, well-brought-out Devon heifer, one year and eight months old, shown by the Queen, got by "Prince George Frederick," and out of "Rose Bud," was invincible for the first prize of 400 francs, or 16*l.* With "Queen Mary," got by "Duke of Plymouth" (1080), and out of "Lemon," Mr. W. R. Fryer, Lytchett Minster, Dorset, came second; while Mr. Farthing had to be contented with a "high commendation"

for "Lassie 2nd," got by "Master Willie" (1163), and out of "Lassie" (3626). The Messrs. Stanford also got a "high commendation" for a fair specimen of the Sussex breed. In the cow class, Mr. Fryer again had the best of a keen tussle with Mr. Farthing, the former coming first with "Quail," a good cow, four years and five months old, got by "Emperor" (1096), out of "Queen," and bred by Viscount Portman, Bryanston; while Mr. Farthing got second with "Lady Bird," a promising heifer, two years and six months old, in-calf, full sister to Mr. Fryer's "Queen Mary." The Messrs. Stanford obtained a "very high commendation" for a good six-year-old Sussex cow. Mr. Farthing, it may be mentioned, did not send his best cattle to Paris. He retained a sufficient number of his "cracks" to take a good position, as has been his wont, at the Bath and West of England and the Royal Shows. The Messrs. Stanford's Sussex cattle were generally well fleshed and symmetrical.

Suffolks.—This breed was at first grouped with the Polled Angus and Aberdeen Cattle, but, through the influence of the British Jurors, it was drawn out, and arranged into classes by itself. In respect of numbers, however, the breed was not largely represented, Mr. J. J. Colman, M.P., Carrow House, Norwich, being the only exhibitor. He showed three—a young bull, a heifer, and a cow; and it was unfortunate that they had no competition, for they would have held their own against formidable opponents. He was justly awarded a first prize for each.

Longhorns.—In the unfortunate absence of classes for themselves, the specimens exhibited of this good old race had to appear in the section composed of "various breeds not included in the preceding categories," or, as it is expressed in England, the Extra Stock Section—a circumstance which must be regarded as barely just to such a valuable breed. The Duke of Buckingham showed a cow and a two-year-old heifer; and Mr. W. G. Farmer, Hinckley, Leicestershire, a cow, a two-year-old heifer, and a one-year-old heifer—all of which competed in one class formed of about 30 distinct breeds, besides nearly half a score of differently crossed animals. The first prize of 400 francs was awarded to a Shorthorn-cross cow, of fair form and excellent quality, hailing from Belgium; while the second prize went to Mr. Farmer's "Gentle," a very handsome two-year-old Longhorn heifer; and the third to the Duke of Buckingham's magnificent nine-year-old Longhorn cow, "Wild Rose." The fourth prize and a supplementary prize both went to Shorthorn-crosses from Belgium—very good animals certainly—but inferior, we think, to Mr. Farmer's fine five-year-old Longhorn cow, "Springflower," that was first at the "Royal" Show at

Liverpool last year, and that handles so sweetly; and still more clearly inferior to his beautiful yearling heifer, "Mayflower." The latter animal was, in the opinion of many, the nicest in the class, and we think she is one of the best specimens of the Longhorn breed of modern times. In general contour she leaves little to be desired, her quality is fair, and her style and promise are satisfactory.

It is worthy of mention here that the first volume of the 'Longhorn Herd Book' has just made its appearance in England, while the Society, formed three years ago, to promote the interests of this fine old breed, has already done good service.

Scotch Cattle.

Polled Angus or Aberdeen.—This rising and valuable beef-making Scotch breed was remarkably well represented. Fifteen were entered, and all were sent. Eight came from Tillyfour, six from Ballindalloch, and one from Keig. This section of the Show was distinguished not only by the presence of some very fine animals, but by what is even more creditable, the absence of anything approaching "a weed." Evidence of this was furnished by the fact that every one of the fifteen animals had either a prize ticket or an "Honourable Mention." This was not all the distinction that was in store for the "black skins," for to them fell the championship of the Exhibition.

The young bull class contained only two animals, "Pride," a well-bred fourteen-month-old, large-sized bull from Ballindalloch, and a tidy little fifteen-month-old youngster, shown and bred by Mr. M'Combie. The latter's dam, a ten-year-old cow, and the daughter of a Battersea winner in 1862, has since been sold at 80 guineas, and the former's dam cost 91 guineas two years ago, while his half-sisters were sold by auction lately at 100 and 91 guineas respectively, and his half-brother, only a few months old, at 100 guineas. Nevertheless, it cannot be said that either of the yearling Polled bulls at Paris was a first-class Showyard animal. The Tillyfour one was placed first. He was very good in front, and neat all over, but was not particularly well filled in the flank, and was not big for his age. Sir George Macpherson Grant's bull, on the other hand, was big and "outcoming;" but he was sharp on the chine, and not so well made up as an animal of less growth would have been.

The same combatants appeared in the old bull class, with a different result. Both bulls were just turned three years, and were bred by Sir George Macpherson Grant, Bart. "Judge," shown by Sir George, was much larger than "Cluny," exhibited

by Mr. M'Combie. The two were in the prize-list at the Edinburgh Highland Show in 1877, and "Judge" was second as a yearling at the Aberdeen Highland Show the year before, while his sire "Scotsman" was a first-prize Highland Society's yearling. "Judge" was easily first, being a bull of great substance for his age. He is not surpassingly fine in his shapes, but he has matured well, girthed 8 feet 2 inches, and was not only the best Polled bull in the Exhibition, but also the heaviest animal for his age. So much was he an object of attraction, that, in order to give him necessary rest and peace, two soldiers were stationed beside him to keep the visitors away. This animal was regarded as one of the "sights" of the Meeting. A Frenchman, who wanted "Judge" for crossing with the white Charolais cattle, offered 200 guineas in vain for him. His dam as well as his sire, it may be added, were bred at Tillyfour. "Cluny" is a nice little bull, good forward, but not so well filled-up aft. In respect of breeding and quality he leaves little to be desired, being descended from Sir George's much-prized "Ericas," his dam having been the third-prize cow "Eva."

Heifers under two years old made a capital appearance. Mr. M'Combie had three and Sir George two, the latter being full sisters. The rule already referred to, by which no exhibitor was allowed to take more than one prize in a class, came into force here. Mr. M'Combie had evidently the best of it in this class. His first-prize one was a very handsome twenty-month-old heifer, with a nice head, fair rib, and grand hind-quarters. For her age she was big, and was very well brought out. Her dam was bred by Mr. Reid, Baads, Aberdeenshire, and was a prize-winner at the Inverness Highland Show as a yearling in 1874, but having ceased to breed, she has since been sent to the Fat Shows, taking first honours at the Birmingham Show of 1878, and beating there the first-prize Paris cow. Very level in flesh all over, and stylish, this heifer was not grudged first honours. The other two from Tillyfour, which got "Honourable Mention," were a heavy twenty-one-month, long-quartered, shapely "Pride," and a handsome yearling of good quality, out of an East Tulloch cow. The "Pride" heifer has a wonderfully true underline, and a splendid front, but she has rather much white on her hind-legs, and "touches" somewhat stiffly. The other one looks like making a very fine cow. Sir George got the second-money premium with "Birthday," the smallest, but the youngest, and decidedly the nicest specimen of the breed in the class. Immediately behind the fore-arm it might have been a little better filled, yet all over it was a beauty. Its symmetry, quality, and plumpness were all that could have been desired, though, if

anything, it was undersized. It was indeed a pretty little picture, and was out of "Bertha," the first-prize cow at the Highland Society's Stirling Show in 1873, while the sire was an Erica bull, "Elchies," bred at Ballindalloch. "Birthday's" full sister was only a few days under the maximum age, but she was not very nice towards the tail, and, though a good useful heifer, had her deserts with an "Honourable Mention."

The class of cows or heifers over two years old was also made up of three from Tillyfour, and two from Ballindalloch, with the important addition of one owned by Mr. George Bruce, Keig, Aberdeenshire. The five first mentioned included the first- and second-prize cows at the Edinburgh Highland Show in 1877; the second-prize yearling heifer on the same occasion, and the first-prize cow at the Perth Highland Show in 1871; albeit none of these got the premier award in Paris. It was given to Mr. Bruce's cow, which, having been hopeless as a breeder at least a year before, had been long under training for the Fat Showyard. On her dam's side she has a rather short-recorded pedigree. Her sire was a cup bull at Aberdeen, and, like most of the animals on her pedigree, was bred at Tillyfour. She was in a higher state of feeding than any others in this section, and accordingly stood the long journey better. Her head, neck, and shoulders were magnificent, and her handsome frame was laden with flesh and fat uniformly taken on. Second honours were hers at the Edinburgh Fat Show in December 1877, when Mr. Bruce purchased her. As noted above, she has gone to the English Fat Shows, but having, through the effects of "foot-and-mouth disease" and long quarantine, lost bloom, she was only placed second at Birmingham and Leeds in December last. There having been no stipulation at Paris regarding the breeding condition of the animals, she was not unfairly, though unexpectedly, pulled to the front; her plump, massive, level appearance proving attractive to foreigners. Mr. M'Combie's "Sybil," a five-year-old cow of Mr. Reid's breeding at Baads, and Sir George's "Eva," a seven-year-old Erica cow of his own breeding, fought their Edinburgh battle of 1877 over again, with a like result. Neither of the two is strong on the back. Both are wide, deep, heavy, wealthy-fleshed animals, on fine bone. "Sybil," however, being younger, won in 1877, and kept her place in 1878. She has a charming head and neck, and stylish gait. She was the first yearling at the Inverness Highland Show in 1874, and the first cow at Edinburgh in 1877; while her daughter was the first yearling at Aberdeen the same year, and got "Honourable Mention" at Paris, where she displayed a noble front and massive proportions for a two-year-old. The other cow from Tillyfour was "Gaily," a four-year-old hand-

some, feminine-looking animal, out of a Ballindalloch cow, sold for 100 guineas, and largely of Tillyfour blood. Her son, a yearling bull, has since gone to Mr. Thomson, Hatton Park, Westmoreland, at 69 guineas. "Eva" is now past her bloom somewhat, and, never having been very strong on the back, she looked, as did her eleven-year-old sister "Eisa," considerably jaded by the journey. "Eva," however, was chosen for the third prize. She stands very wide in front, and has been a frequent winner at the Scotch National Shows. "Eisa" was a cup-winner at Aberdeen, as well as a first Highland Society's cow, and was nicer in "her day" than any Polled female at Paris. Her age prevented her from taking the position on the Seine which she has often done in Scotland, but an "honourable mention" was well bestowed on her. She and "Eva" are two of the best bred cows of the present day, and, though past their best, they would bring considerably into "the three figures" in the market. The Erica pedigree, though not the longest, has perhaps fewer "stains" than any other in the 'Polled Herd Book.' The "Pride" family, however, double it in the number of registered crosses, though some of the later crosses can hardly be said to have improved the tribe.

The contest for the 100*l.* for the best group of cattle bred by the exhibitor in the Division foreign to France, was practically confined to the Tillyfour and Ballindalloch Polls, and Lady Pigot's Shorthorns. The Tillyfour lot included a four-year-old cow, four heifers, and a yearling bull, and had the bloom of youth to recommend them. The Ballindalloch group was more valuable perhaps, individually in the market, and included all the animals forwarded by Sir George. The conditions of the competition required the presence of at least one bull and four females. Sir George had just the yearling bull more than the minimum and he drew him in with the others, but did not thereby heighten his chances of success. The weak point in the group was its inequality, and the presence of the little bull rather aggravated that defect. Mr. McCombie's group, on the other hand, was weak on the male side, but was exceedingly strong in females and uniformly made up. From the tidy little yearling bull up to the four-year-old cow his lot were graded like steps of stairs, and wholly composed of nice animals, evenly covered with flesh and looking their very best. Though these two groups had the honour of remaining last in before the Jurors in this critical contest, the only division was on the Polls *versus* Lady Pigot's Shorthorns. Her Ladyship's Shorthorns, as previously intimated, did not appear in so good a form as they have sometimes done in Royal English Showyards. Unfortunately, some of her best cards, such as "Zvezda," were past

their bloom, and her ladyship's bulls were hardly up to the mark. The "red, white, and roan," however, had their advocates among the Jurors; but a large majority decided in favour of the blacks. Lady Pigot's group was accordingly turned away, though the favourable impression they made on the Jurors led to their being awarded a special prize of honour in the shape of an "object of art;" which was also given to Her Majesty the Queen, for her Herefords, Devons, and Shorthorns; and to Mr. McCombie, of Tillyfour, whose black group, on account, no doubt, of their youth and symmetry, was preferred to the Ballindalloch lot for the coveted premium of 100*l.*

The only occasion on which British and French cattle had any opportunity of trying their respective merits was in the competition for the 100*l.* prize for the best group of beef-producing animals, bred by the exhibitor. After the verdict already noted, the public will be prepared for the fact that Mr. McCombie's was really the only group firmly pitted against the French cattle for this prize. The adjudicating bench had by this time increased from 16 to 31. Eventually the chance of France achieving the honour was reduced to Count de Massol's Shorthorns. They were really a good, useful, well-fleshed, evenly matched group, and ran the Polls much closer than the English Shorthorns did. But ultimately, by a majority of 24 to 7, the Aberdeenshire animals triumphed.

This breed is rapidly rising in value and increasing in numbers. The favourable impression it made on many visitors to Paris has led to fresh inquiries after Polled animals from various countries. Regarding the maturing properties of this breed erroneous impressions have hitherto existed. It has often been said that Polled Angus or Aberdeen beasts are slow in ripening. Those who said so must have had no experience of the improved race of cattle of that description. When well fed from calf-hood, they will come out quite ripe at the age of two years and some months, though they will "keep" longer, and retain their levelness and quality of flesh. Three-year-olds of this breed have in recent years carried the championship several times at the leading English Fat Shows. The early maturing faculties of the "Polls" should, even outside their own country, be placed beyond doubt by the fact that only one of Mr. M'Combie's best "beef-making group" of six was over two years and a few months. Gentlemen with a hobby for the possession of three- and four-year-old black Polled bullocks "spare" the animals in the matter of diet until the last year; hence to a considerable extent the grounds for the idea entertained by many that the breed is long in ripening. Another cause of this opinion is the fact that, until comparatively

recent years, few of the owners of Polled Scotch cattle were good feeders. The animals were not kept progressing from birth. All this has been changed within the last fifteen years; and when liberal feeding and good management are bestowed, it has been proved to demonstration that the Polled Angus or Aberdeen cattle are early maturers, and very profitable beef-making animals.

Scotch Highland.—Of this shaggy breed there was only one exhibitor, namely, Mr. James Duncan, Benmore, Kilmun, Argyleshire. He showed half-a-dozen, all good specimens of the breed. Among them was the fine three-year-old bull got by "Prince," and out of "Queen," and that won the first prize at the Highland Show at Edinburgh in 1877. His outline is good, and his quality and style are excellent, his countenance being that of a true West Highlander. In the cow class the handsome six-year-old cow of the Bochcastle stock, after "Athole," that won the first prize as a three-year-old at the Highland Show at Glasgow and the third at Edinburgh in 1877, stood alone, and was readily awarded the first prize. Four very good animals were entered in the heifer class; a very handsome two-year-old, also of the Bochcastle stock—as, indeed, were all the lot—getting the first prize. The regulations precluded Mr. Duncan, as well as every other exhibitor, from taking more than one prize in each class, so that only three first prizes were awarded in the Highland Section. Two of these amounted in value to 400 francs, or 16*l.* each, and the other to 700 francs, or 28*l.* It is worthy of mention that Mr. Duncan had the honour of forwarding his first-prize bull and first-prize cow to the residence of Rosa Bonheur, to be immortalised by the brush of that talented artist. The Bochcastle herd, from which several of Mr. Duncan's animals were descended, has long been one of the best of its kind. Only the other year a two-year-old Highland bull, bred by Mr. Stewart, was sold for 200 guineas.

Ayrshires.—This valuable dairy breed was almost without representation—at any rate in the "Foreign Division," for in it only one specimen was exhibited—a fair five-year-old cow, shown by Mr. Wood, The Wilderness, Aintree, near Liverpool. She was awarded a third prize, of the value of 250 francs. As explained in the introduction, a better display of this breed would have come forward if exhibitors had had any prospect of their stock being judged by men acquainted with the characteristics of this useful race of cattle.

Irish Cattle.

Kerry Breed.—In the Cattle Department, Ireland was represented by one breed, namely, the small black Kerry cattle.

Mr. James Robertson, La Mancha, Malahide, county Dublin, his three sons, and Mrs. Robertson, were the only exhibitors. They showed in all about a dozen of these neat little animals, and as specimens of the Kerry breed they would not have been easily beaten. The first-prize bull, in particular, was a very fine specimen of the breed—neat, even, and proportionate. This breed of cattle is perhaps not quite so well known as most of the other British breeds referred to in this Report, and therefore a few sentences on its general characteristics may be of interest.

By Youatt the Kerry is regarded as an aboriginal Irish breed, and the cow is spoken of as "truly a poor man's cow, living everywhere, hardy, yielding, for her size, an abundance of milk of good quality, and fattening rapidly when required." A good specimen of the breed may be described as a small, neat, lively animal, with light round frame, narrow rumps, fine bone, rather long limbs, fine small head, keen eye, and white upstanding horns with black tips. The prevailing colour is jet-black, but some are red and some brindled. The beef of the Kerry is of the finest quality, and for their size they carry a fair quantity of it. A well-fed, fully grown Kerry steer will weigh about 4 cwt., dead weight. Twelve quarts of milk are reckoned as the daily average yield for a Kerry cow during the season, and from 6 to 7 lbs. as the weekly yield of butter. Cows have been known to give as much as sixteen quarts of milk daily for some time after calving. The breed is one of the hardiest existing in the British Isles, and we were informed that some of the specimens exhibited at Paris had hardly ever before been under a roof. For many years this breed was greatly neglected by the Irish farmers, which led to a slight deterioration in its "rank and file." Recently more attention has been bestowed upon it, and some improvement has already been effected. Prominent among the improvers is Mr. Robertson. A famous Show bull of the Kerry breed ("Busaco") belonging to this gentleman, when exhibited as a two-year-old, measured 34 inches from the shoulder-top to the ground, and 38 inches from the shoulder-top to the tail-head, and girthed behind the shoulders 4 feet 2 inches.

Dutch Cattle.

In the Foreign Division there were 59 entries of this valuable race of cattle, 42 of which came direct from Holland, 9 from France, and 8 from Belgium. Throughout Great Britain the Dutch breed is one of the best and most favourably known of all the Continental breeds, and that it deserves the distinction we have little hesitation in affirming. For many years it was imported in large numbers; and while it proved itself a fair sort

of beef cattle, it perhaps surpassed most in the dairy. As a butcher's breed it may be ranked behind the white Charolais of France, but, taking milking and beef properties together, the question of preference is not so clear. For the purposes of labour the French breed is entitled to the first position. In France, therefore, where working bullocks are so much in request, the advantage all over might lie with the Charolais race. In Great Britain, where horses leave little to be done by bullocks, the advantage, perhaps, might lean the other way. For many years large numbers of Dutch cows were imported into England and Scotland, and extensively kept in the principal dairies in and around London and other large towns. They milk well, but when dry are not so easily fattened, nor are they so valuable when fat, as Shorthorn or Shorthorn-cross cows. Some store cattle for fattening have been brought from Holland to this country, but they are slow feeders, and have not paid very well.

The characteristics of the Dutch race are very marked. The prevailing colour is black and white, in unmixed spots, some being gray, or "pepper" coloured. In general form this breed resembles somewhat the Shorthorn. The Dutch animals stand rather higher, that is to say, they have longer legs than the Shorthorns; their frame is equally as long, and their quarters often as well-drawn-out and as broad. Indeed, their quarters are generally excellent, sometimes almost perfect, being long, broad, even, and as straight behind as could be imagined. The head is rather long, but fine; the forehead is broad; the eyes are large and bright; horns are slightly turned forwards, and frequently black; neck is slender and tapering; breast is often a little narrow; shoulder and fore-arm are not very powerful; rib is pretty well sprung, and loins and rumps as a rule are excellent. The tail is usually well set, long, and bushy at the end. The leading property of the breed, as already indicated, is its wonderful milking powers. Thoroughly good specimens have been known to give over 40 litres (about 70 English pints) of milk in 24 hours; and we were assured by M. D. Geode, one of the principal exhibitors, that his cows gave an average of 25 litres (nearly 44 English pints) per day all the year round. When giving such large quantities of milk as this, however, the animals have to be liberally fed; and, as to their food, they are as a rule somewhat fastidious. The race is fairly hardy, and quickly adapts itself to strange soils and climates. It still has its head-quarters in Holland, but has spread and become popular over a great part of the Continent. Change of climate, soil, and treatment, have wrought modifications in the outward appearance of the breed; but with all these, and wherever situ-

ated, it retains its fundamental characteristic as valuable for the production of milk. Dutch bulls have been extensively used in France in crossing with other breeds, particularly the Flemish race, and the crosses thus bred are not only excellent milkers, but also good beef cattle. The breed has long been kept tolerably pure in Holland, and in 1875 a Dutch 'Herd-Book' was started by "The Herd-Book Society of the Netherlands." The entries already number over 300, and there can be no doubt that the movement will result in the further improvement of the race. One rule attached to entry in the 'Herd-Book' deserves notice. It is novel, but not without recommendations. When registered, the animal is branded on the side and on the horn with its number in the 'Herd-Book.'

Most of the young bulls exhibited were shapely, and of good quality, the old bulls as a rule being heavy, but rather plain. The cows formed the charm of the lot. A few were indeed very handsome animals, large and massive, with fine, soft, mellow skin and kindly touch. A slight coarseness of bone was observable in some, while a good many were a trifle narrow in front. It was evident that, in awarding the prizes in the cow class, the Jurors had given most weight to the "appearance of milk" presented by the animals. The first-prize cow was far from being the most handsome in form, but she had calved very recently, and showed wonderful development of the milk-vessels. A four-year-old cow, fully an average in size, girthed 6 feet 9½ inches, measured 5 feet 5 inches in length from the shoulder-top backwards, and 4 feet 4 inches in height at the shoulder. We asked the price of this cow on behalf of a Scotch farmer, and found that she could not be bought under 80*l.* Others were offered at from 50*l.* to 100*l.*, the cow offered at 50*l.* being a "pepper"-coloured one of good build, but rather under-sized. In the bull class the first, second, and fourth prizes, and an honourable mention, went to Holland; the third prize to France; and the fifth and a supplementary prize to Belgium. In the cow class the first and a supplementary prize went to Belgium; and the second, third, fourth, fifth, and six tickets of honourable mention, to Holland. The largest lot from Holland were exhibited by the Herd-Book Society; the French winner was M. Roberti, Paris; and the most successful Belgian exhibitor, M. Derboven, Malines.

Belgian Cattle.

Though not figuring conspicuously with any breed which could be called peculiarly its own, Belgium had nevertheless no fewer than 108 entries of cattle in the Catalogue. Nearly one-half were Shorthorns; but a few of those entered did not appear.

As a lot, the Belgian Shorthorns were hardly up to the mark. Many of them were plain, narrow, and lanky, wanting in flesh and substance. A Belgian exhibitor, however, M. Mathieu, Thourout, West Flanders, had the credit of beating Lady Pigot, and of heading the prize-list, in the young Shorthorn bull class. Only three bulls competed, however, and none of the three was above average merit. In the old bull class, which was only a degree more creditably filled than the young one, Belgium claimed the third and fourth prizes, as also an honourable mention. The strength of the Belgian Shorthorn muster lay in the cow class; and we were not surprised that the Belgian Jurors were dissatisfied with the awarding of the five prizes to English cows. It was perfectly clear that England deserved all she got—all that was available in the class; but, naturally enough, it was discouraging to Belgians that for their contingent, numbering close on thirty animals, they had been adjudged nothing higher than an honourable mention. They accordingly petitioned for three supplementary prizes, specially for Belgian cows, which the French authorities, with most commendable liberality, at once granted. The British and other Jurors cordially joined the Belgians in this petition, believing that the spirit and enterprise shown by Belgian farmers in bringing out so many of their pure-bred cattle deserved recognition. Though lacking character and substance, a few of the Belgian Shorthorn cows exhibited evenness, fine bone, and fair quality. It is obvious that great improvement might be effected in the Belgian Shorthorns by the introduction of more of the best English blood. Good British bulls put on the present breed of Shorthorn cows there, together with a little more liberal feeding when the animals are growing, would impart symmetry, substance, wealth, stamina, and quality to the animals.

The tenth Section in the Foreign Division, "Breeds of the Polders and Low-lands of the North, not comprised in the preceding Classes," was filled almost exclusively by Belgian cattle. About one-half of the animals in the Section, 16 in all, were of the Flemish breed, which will be more fully noticed hereafter. Only one young bull appeared, and he was not thought worthy of a prize. In the old bull class, which was composed of four animals, the first prize was withheld, the second being awarded to a little black bull, three years and six months old, with spotted muzzle, white stripe in the face, short black buffalo-looking horns, thick, clumsy neck, strong forearm, moderately fine bone; owned by M. Roberti, Paris. The third prize went to a Flemish bull from Belgium, a monster in size, with massive crest, coarse bone, uneven form, dun colour, and short black-tipped horns.

He was entered as thirty months old, though to a stranger he looked more like twice that age. The first-prize cow, entered as a Fleming, would have passed as a cross between the Shorthorn and Flemish breeds, being a sort of roan in colour, proportionate in shape, nice in bone, and altogether just what, in England, would be regarded as a good average Shorthorn-cross. The second-prize cow, also entered as Flemish, showed similar symptoms of an admixture of Shorthorn blood. She too was roan in colour, of fair quality, fine head, and generally well-made-up frame, though rather plain quarters. Most of the other cows were good specimens of the Flemish breed; two of them and all the heifers being of the same sort as the second-prize little black bull. In colour they were black and white, marked similarly to the Dutch breed, but in size and "make" they showed more resemblance to the Kerry breed of Ireland.

Again, in the Section for different breeds, "not included in the preceding Sections," Belgium had not only the largest number of entries but also carried off the lion's share of the spoil. Indeed, with the exception of a second and a third prize which came to England for Longhorns, Belgian cattle won all the honours. The majority of the animals in this Section were Shorthorn-crosses of different kinds. Unfortunately, only in a few cases did the Catalogue indicate the breeding of the animals beyond saying that they were "Durham Crosses;" and the difficulty as to language made it impossible always to obtain satisfactory information where it was wanted. The majority, however, of those which hailed from Belgium were evidently crosses between the Shorthorn and the Flemish breeds, the characteristics of the former largely predominating. It certainly could not be said that success had been attained in every case, but, taking the class as a whole, a great improvement had been effected by contact with the Shorthorn. Further on we shall refer to the wonderful ameliorating influence of the Shorthorn when crossed with other breeds, and shall here only give a few notes on some of the animals in this Section. The class for bulls contained about twenty animals, and presented perhaps nearly as much variety as any other class in the Exhibition. The winner of the first prize, belonging to M. Lorio Thulin, Hainaut, was clearly among the best in the class. Indeed, barring a little roundness, he would have passed as a fair specimen of the Shorthorn breed. He was entered as a Shorthorn-cross, and looked like a cross between a Shorthorn and a Flemish. Red in colour, with white spots, his muzzle was blue, and his head rather short and clumsy. The second-prize bull, also from Belgium, was similar in colour, form, breeding, and general characteristics; and though entered as fourteen months, he had an older

appearance. His quality was fair, but he also lacked true Shorthorn character. The third-prize bull, owned by M. Derboven, was entered as a Dutch-cross, and would have passed as a cross between the Dutch and the Shorthorn. Black and white in colour, he was two years old, and was a thick well-fleshed animal; muzzle and horns were black, fore-rib and shoulder-top excellent. A very fair Shorthorn-cross from West Flanders, thirty-nine months old, came fourth; while an Ayrshire-looking Shorthorn-cross from Liége, Belgium, got an honourable mention. The latter showed fine quality and hair; spotted muzzle, fair head and horns, stood neatly on his legs, but was plain and round behind. Several of the others in the class would have passed in England as good crosses between the Shorthorn and the Ayrshire breeds; others were evidently crosses between the Shorthorn and Dutch breeds, showing better beef properties than the pure Dutch, but a plainer form than the pure Shorthorn.

The female class, which numbered about thirty, was similar to the male class in regard to character, form, colour, and breeding. The first prize went to a very handsome four-year-old Shorthorn-cross, lacking substance and character, but full of quality. Dark roan in colour, she handled exceedingly well, and was owned by M. de Wonck-Valéraine, Cras-Avernas, Liége, Belgium. The second and third prizes went to Longhorns, already noticed. The fourth prize was won by a thick two-year-old Shorthorn-cross, owned by M. Tiberghien, Manage, Hainaut, who exhibited a lot of very good cattle. Several of the females were rather leggy and wanting in flesh and character; nearly all had either black or spotted muzzles, and the majority had dark horns and plain hind-quarters. Thick stiff skins were also too plentiful, and so were flat ribs. One of the best-looking cows in the class, a heavy handsome six-year-old Shorthorn-cross, owned by M. de Wonck-Valéraine, was entirely passed over by the Jurors. She was a trifle light in the waist, but in every other respect was at any rate the third best cow in the class. In England she would have ranked above the average of Shorthorn-crosses.

Danish Cattle.

Denmark was represented in the Cattle Department by about a dozen animals, owned by two exhibitors. The Danish breeds of cattle are so fully described in the admirable "Report on the Agriculture of Denmark," drawn up by Mr. H. M. Jenkins, and published in part ii. of the 12th volume of the second series of the Royal Agricultural Society's 'Journal,' that little more need be added here. The first-prize bull was a gay-looking little animal, of the *Angeln* breed, close on four years old, with

rather clumsy head, thick neck, clean well-shaped horns, black muzzle, very rough tail-head, light thighs, and rather deficient flank. He was bare of flesh, and badly "ribbed-back." Though the four year-old *Fionie* * bull, in the same class, was apparently not thought worthy of the second prize, he seemed to those unacquainted with the breed superior in some points to the first-prize bull. Red in colour, he had a beautiful horn; head and neck handsome, quality good, size moderate, legs long, and thighs bare. The first-prize cow, also of the Angeln breed, was a very tidy little animal, with fine bone, sleek mellow skin, very sharp on the shoulder-top and all along the back, and possessing in a high degree the elements of an excellent milker. As a lot the cows were keen, lively, and light-legged, displaying some resemblance to the red deer, with fine skin, narrow frame, flat ribs, sharp back, long turned-up horns, black muzzles, slender neck, and very light thighs. Their value as beef-producing cattle is not so great as their worth in the dairy. Still a considerable number of cattle is annually imported from Denmark into this country for beef. These belong, however, to the Jutland breed, which is black and white, and of comparatively little value for milking purposes.

Swiss Cattle.

Swiss breeds were the only races that appeared in the Section set apart to Central Europe. Switzerland itself exhibited 45; France contributed 5 more. Of the Swiss race proper 32 came from Switzerland and 4 from France. Perhaps no breed in the Exhibition had more marked characteristics than this one. The prevailing colour is a sort of dun or "bay-chestnut," often showing a black tinge, and invariably a light-coloured stripe along the back and round the muzzle. The size varies, but as a rule the cattle are large; the head is short, thick, and clumsy; the mouth is large; the horns are thick, and usually black; the neck is pretty thick, and the frame generally long, and occasionally well drawn out behind, but hollow on the back; the chest is wide and well formed; the forearm is powerful, the bones are rather large, and the muscular development is very prominent. "The tail does not offer at its source that exaggerated height which was formerly considered a point of beauty, but which is now more properly considered a grave imperfection" (Moll and Gayot). It is not claimed that the race is anything more than moderately valuable for beef pro-

* These cattle are the country cattle of the island, known as *Fionie* to the French, Fünen to the Germans, and Fyen to the Danes. They bear the same relation to the Angeln as the common Yorkshire cow does to the pedigree Shorthorn.—Ed.

duction, but the cows give large quantities of very fine milk, about 30 English pints being the daily average. They are robust and docile, and easily pleased with food. Their working powers are great.

This department of the Exhibition presented a quiet, contented, picturesque appearance, which at once carried one's mind away to the lonely mountains from which these animals hailed. Each had its bell hanging near its head; and it seemed as if ringing these were a favourite pastime with the animals, for the neighbouring stables constantly echoed with the shrill tolling of the Swiss bells. The first-prize-winner in the cow class, which numbered 23, had great appearance of milk, finer bone than most of the others, drooping quarters and sharp back, but excellent quality, and nice soft free skin. The second also showed good milking properties and rare quality. Several of the other cows were much larger, and had also better and truer build. It would therefore seem that the milking properties of the breed were regarded as of paramount importance. The Agricultural Society of Switzerland exhibited several good specimens of the breed, and, besides two third prizes, obtained three tickets of honourable mention.

Sixteen representatives of the Swiss *Simmenthal* race were also exhibited from Switzerland. In colour and general characteristics they are nearly as uniform as the Swiss breed of which we have just been writing. The face and legs are usually cream-coloured, the body is light dun and sometimes mixed with pale white, the horns are neat and small, ribs flat and quarters deficient. The first-prize bull had a very neat Shorthorn-looking head, white muzzle, tremendously thick neck, long dewlap, rather strong bones, round and compact body, short quarters, badly-set tail, well-covered shoulder-top, and thick well-let-down thighs. He belonged to the "Society of Breeders of the Lower Simmenthal," by which some very good specimens of the breed were exhibited. The females were much better; some of them, indeed, being handsome well-made-up animals, resembling in many respects good Shorthorn crosses. Others, again, were rather masculine-looking, too much "rounded-off" in the frame. Some handled well; others were stiff in the skin, hard in the hair, and bare of flesh. On the whole, however, they could claim many good points. Of the *Fribourg* species of the Swiss race, only two were shown, and neither of these was above mediocrity.

Italian Cattle.

In the Cattle Classes there were 19 entries from Italy, but two or three of the animals were not present. It cannot be said

that, as a lot, they were good beef cattle, but the display had at least the merit of presenting abundance of variety. It included four different breeds and two distinct crosses. The specimens of the *Val di Chiana* breed and the crosses from the same sort were indeed wonderful animals. They were light grey or blue in colour, of immense size, and very rough in bone and form, bare of flesh, low on back, and high on shoulder-top and rump. The Val di Chiana-Romagnole bull, shown by M. Lundi, had about as many visitors as any other animal in the Exhibition, for he could claim the distinction of being both the tallest and the ugliest animal within the enclosure. He measured close on 6 feet in height at the shoulder, and in general form might have passed, we should think, as the prototype of the ancient cattle of labour, which Palladius says were "tall, with huge members, of stern countenance, small horns, brawny and vast neck, and confined belly." M. Bertani's bull was very nearly as tall, measuring 5 feet 7 inches at the shoulder-top—a giant height for a two-year-old! Though entered as twenty-four months old, examination proved that he had passed that age at which the mouth ceases to be a safe indication; indeed, in general appearance he was quite a patriarch. He girthed 7 feet 3½ inches, measured 6 feet from the shoulder-top backwards, and 2 feet 8 inches from the fore flank to the ground.

Two or three specimens of the *Pugliese* breed were also tall, gray in colour, big in bone, with thick plain quarters, light waist, heavy dewlap, long limbs, and were seemingly better suited for work than for producing either beef or milk.

A bull and a cow of the *Romagnole* breed were blue in colour, and could not claim beautiful form, but displayed better quality than some of the other breeds in the Section. The bull, entered as two years old, was sharp and slack on the back, very high on the shoulder-top, had great development of dewlap, long horns and black muzzle. The cow, three years old, was of finer quality, with a neat head, turned-up horns, black muzzle, flat rib, deficient quarters, and light flesh.

Four or five animals of the *Reggiana* sort were shown by the Agricultural Society of Reggio-Emilia. It could hardly be said that their admirers were numerous. Bright dun in colour, they presented characteristics very similar and marked. Large in size, they had long, but not very even quarters, white muzzles, and thick massive bone, and were, on the whole, of rough build. The females handled better than one would have expected from the first glance; but their general appearance was masculine and clumsy. Lovers of "ox-tail soup" must have looked at them with some interest, for they were most liberally provided with the development which supplies that savoury nutriment.

Portuguese Cattle.

Nineteen of these were exhibited, all by M. Gagliardini, Director of the Training-Farm of Central Portugal. Like the Italian display, the Portuguese exhibited great variety and very marked characteristics, four different breeds being represented. To a British eye the neatest and most taking animals were those of the *Aronqueza* breed, of which three specimens were shown. They are a sort of red in colour, and little in size, but neat in shape. The first prize in the bull class was awarded to an animal of this breed. In outline and covering of flesh he had no equal in the Section. Though four years old, he would, perhaps, not have "dressed" more than 3 cwt. Along the top he was broad, even, and well clad; his thighs were good, skin mellow, and touch soft. On his legs he stood prim and neat, but had plain sharp shoulders and clumsy head. The other two were females, and were similar to the bull in general appearance. They had truer under-line than most of the others, but were not free from that narrowness of chest which is characteristic of so many of the Continental breeds.

Not unlike these in colour, size, and form, were the animals of the *Barroza* race, of which one bull and two cows were exhibited. The bull, three years old, was neat, but very small in stature, perhaps not more than one-fourth the weight of some of the others in the class. His skin was soft and thick, quality good, horns thick and black at the point, colour red, with a dark tinge about the neck and dewlap, curious white ring round the mouth, and black muzzle. One of the cows, a three-year-old, was indeed a very pretty creature, but exceedingly small. Her horns were long and white, eye bright and lively, head and mouth very tidy and well balanced, and on her limbs she stood beautifully.

The *Mirandeza* breed, of which there were two bulls and two cows, has little, at least in appearance, to recommend it. Our verdict at the time we examined the animals, as it appears on our note book, was—"little miserable-looking creatures, bad shapes, stiff hides, thick clumsy legs, red or brindled in colour, seemingly of little value for any purpose whatever."

Perhaps the strangest of the lot were the entries of the *Alemtejana* breed, two bulls and two cows. Large in size, reddish in colour, and roughish in general get-up, their quality was inferior, and their head and face were strangely formed. The forehead was curiously bent backwards, face very long and mouth nice. One of the cows measured no less than 14 inches from the eye to the tip of the nose.

In addition to these breeds, four specimens of the *Gallega-*

Vermelha cross were exhibited by M. Gagliardini. They were also a sort of red in colour, with white rings round the eyes, and white muzzles. Little in size, they had narrow frames, short quarters, flat ribs, clumsy head, but fair quality and bone. One of the two bulls was broad, and fairly covered with flesh; but would have measured nearly as much round the neck as round the woist.

French Cattle.

The display of French cattle, or, more properly speaking, of cattle belonging to French farmers, was a marvel in its way. Perhaps no other nation in the world ever mustered for exhibition so large a number of cattle; probably no other nation in the world could exhibit so many different races and sub-races of cattle as France did on this occasion. Its entries numbered in all 1314, and of empty stalls there were very few. The following Table indicates the various races, sub-races, and varieties of crosses represented, the order in the Catalogue being followed:—

Race.	Entries.	Race.	Entries.
Norman	150	Bourbonnais	2
Flemish	84	Manceau	1
Charolais	66	Maraichin	2
Gascon and Carolais	23	Bourguignon	4
Garonnais	43	Montbéliard	6
Bazadais	14	Morvandeau	6
Femelin	57	Meusien	3
Pyrenees races (several varieties)	39	Boulonnais	2
Limousin	69	Lorraine	1
Salers	81	Shorthorns	138
D'Aubrac	47	Ayrshire	13
Mézenc	29	Dutch	60
Parthenais and two sub-races, Mantais and Vendéen	58	Swiss	39
Tarentais	52	Glane	2
Breton	58	Shorthorn crosses	93
Comtois	9	Various crosses	47

It will be easily imagined that, with such variety of form, colour, and general features, as so many different breeds necessarily presented, the French Division of the Cattle Department contained much that was interesting as well as instructive. The display was, no doubt, a fair, and perhaps a favourable, sample of the general cattle-stock of France; and it is pleasing to be able to say that in the collection there was a large number of animals of high merit, whether viewed as "general purposes" beasts, as butchers' cattle, as milk- and butter-producers, or as animals of labour. We cannot help thinking, however, that there was rather too much variety in the collection,—too many

breeds which are perhaps valued in particular districts as good workers, as being easily kept, hardy and docile, and perhaps also, in some cases, as being fair producers of milk and butter, but which as butchers' or beef-yielding animals are next to worthless, or, at any rate, are of a very inferior description. There were too many narrow frames, flat ribs, long legs, light waists, scooped quarters, weak backs, hanging dewlaps, deficient flanks; and too much bone and too little flesh; in short, too many "scraggy" animals.

Doubtless it is desirable, indeed essential, that a country possessing such variety of soil and climate as France should embrace several different breeds of cattle, so that each particular district might be stocked with the race or sub-race best adapted to its peculiarities. There can be little doubt, however, that this idea has been carried too far in France. It has been followed to the loss of all concerned, first the farmers themselves, and then the nation at large. We should say that at least one-third of those races and sub-races of cattle exhibited in the "Home Division," and mentioned in the list on p. 199, are not worthy of the care and attention of the farmer, nor are they the cheapest produce any country could raise; and they could hardly be regarded, in any sense of the term, as profitable farm animals. It is claimed for each of these inferior breeds that it has some particular and exceptional qualifications which recommend it to the attention of farmers of certain districts; that it is well suited for light farm work; that it will live on food upon which few other breeds would survive; that it gives a good supply of excellent milk; that it requires very little attention, no housing and no herding. All this may be true so far; but if these special services can be got, even in a modified degree, out of cattle of much superior merit, why cover even a poor country with those ill-shaped unprofitable creatures, whose value as butchers' beasts—the natural and proper end of all cattle—is scarcely worth reckoning? France might weed out one-third of its numerous breeds of cattle, and still have its farm work as well attended to as now, its varieties of soil and climate as well suited, and at the same time have its yield of beef increased twofold. As a rule, it is undeniably bad farming, therefore bad economy, to breed and keep cattle which are useful only for their milking or working properties, inasmuch as these properties are obtainable in a very high degree in breeds which are also valuable as beef-producers. In the greater part of France, indeed in the whole nation, with the exception of Maine, and parts of Anjou, and of Eastern Brittany, it is stated that under the present system of farming the first and primary objects for which cattle are kept are milk and labour. Making all due allowances for the peculiarities of the country, this is

surely not exactly as it ought to be. It is calculated that "France rears enough cattle for her own wants;" but should not so well-favoured a country be equal to more than that? It was estimated that 10,469,000 head of cattle in France in 1873 yielded 464,283 tons of beef—a small yield certainly, even taking into account the large number of calves annually slaughtered. The 10,240,000 head of cattle in the United Kingdom in 1876 produced about 800,000 tons of beef. We have been led into this digression mainly by a feeling of regret that in so rich a country as France there should be so many inferior varieties of cattle; and partly also by the unsatisfactory character of the reason given for this—namely, that the working and milking elements, which are of paramount importance in France, cannot be found, or developed, in sufficient degree, in breeds also valuable for beef. We must now proceed to speak in detail of the different breeds in the French Division, beginning with Shorthorns, as being of special interest to English agriculturists, and afterwards following the order of the Catalogue.*

French Shorthorns.

The history of the Shorthorn in France dates from 1825. In that year M. Brière, of D'Azy, Nièvre, imported from England one bull and six cows, all descended from "Comet" (155), and "Favourite" (252); and a few years afterwards MM. Hunt and Brewter, tenants on M. Brière's estate, made two other small importations. Probably, in the main, from want of knowledge of the characteristics of the race, these enterprising gentlemen met with limited success. The produce of the imported animals did not realise the expectations that were entertained of them, and after some time the majority of the animals were scattered through the adjacent districts, and, in a manner, lost. A few, however, passed into the hands of a M. Jachard, who, with creditable perseverance, formed a herd which grew and prospered, and doubtless conferred substantial benefit on the surrounding country. In 1836 the Minister of Agriculture, recognising the necessity for something being done by the State to improve the native breeds of cattle, imported, through M. Yvart, Inspector-General of the Veterinary School at Alfort, seven females and one bull of the best Shorthorns that could be obtained in England. These were placed in the Veterinary School as objects of study; and so favourably was the movement received, that soon after nineteen females and fifteen males

* It will be noticed that the writers of this Report have throughout criticised the foreign breeds from a British, and indeed almost from a Shorthorn point of view.—Ed.

were imported. Of this last importation twelve bulls were at once re-sold to leading French agriculturists; while the others were located at Pin, where they formed what might be called a Government Experimental Herd. The first sale of bulls reared at Pin and Alfort was held in 1839, when the demand was found sufficient to warrant more importation.

Between 1836 and 1848, 108 male and 89 female Shorthorns were thus introduced into France; while in 1849 an importation of considerable importance was made for the foundation of a Herd at the General Agricultural Institute at Versailles, an institution which, unfortunately, flourished only for a short period. Pin being found more suitable for the strange breed than Alfort, the two herds were united, and carried on successfully at the former centre. The demand for the young stock was, as a rule, fully equal to the supply; and around Pin they proved prolific and throve well. When, however, they were sent into districts, the climate of which differed materially from that of Pin, they did not succeed so well. To overcome this difficulty as far as possible, it was resolved to acclimatise the breed in several localities; and accordingly the herd at Pin was partly broken up. In 1843 two bulls and eighteen cows were sent to Saint-Ló, Dep. de la Manche, and in 1844 seven bulls and twenty-two cows to Poussery, Nièvre; and, three years later, two bulls and eight cows went to a Government farm in Mayenne. After some time these breeding dépôts successively disappeared; and since 1861 the national Shorthorn herd has been kept at Corbon, a Government farm, which was established as an annexe to the dépôt at Pin in 1854, and which is well situated in the celebrated grass-land district of the Pays d'Auge in the department of Calvados. The favourite English breed had by this time got a footing in the country; it had earned a good name among French agriculturists, particularly for the wonderful ameliorating influence it displayed when crossed with native breeds; and it has grown in numbers, and gained in popularity year by year—"its partizans are numerous, and its numbers could no longer be counted." The French 'Shorthorn Herd Book,' which seems carefully conducted, has reached its eighth volume. It contains the pedigrees of over 19,000 pure-bred Shorthorns.

The Shorthorn Section in the French Division was not only the second largest in the Cattle Department (the largest having been the Norman breed), but, to Englishmen at any rate, it was one of the most interesting in the Exhibition. The Catalogue contained no fewer than 138 entries, and the absentees were, indeed, very few. That the average merit of the display of French Shorthorns was superior to that of the English must

have been evident even to the most casual observer; yet a comparison of the Shorthorn strength of France, in full muster at Paris, and that of England at Bristol a month later, showed a clear superiority in favour of England. That this should be so need surprise no one, and should be no discouragement to French breeders; for it must be remembered that, both as to experience and material at command, our English Shorthorn breeders have had a great pull over their brethren in France. It must be admitted, and we do so with pleasure, that French breeders have made a very creditable use of their comparatively short experience, as well as of the limited materials within their reach. They have not all been equally successful—our own breeders have not been that—but they have shown a keen appreciation of the properties of the breed, and have displayed some skill and commendable care in the rearing of it. The display of French Shorthorns was in some respects fully up to expectation, yet the collection exhibited certain defects to which we may here allude. Perhaps the most general and striking of these was a want of what is well known as true Shorthorn character —those square, well-drawn-out, well-balanced, symmetrical proportions, which make the ideal Shorthorn fill the eye so pleasingly from all points of view. To put it the other way, there was a roundness and a commonness about many of the animals which deprived them of true Shorthorn type and style, and which are usually regarded by Englishmen as suggestive of mixed breeding. There was also a plainness about the head, a deficiency of quarter, a flatness of rib, and a want of rich natural flesh. Their hair, too, was shorter and harder than that of average English Shorthorns; it wanted that soft velvety touch which adds so much to the apparent quality of English Shorthorns. Taking the warmer climate of France into consideration, however, this is easily accounted for, and is a less serious fault than most of the others. Weight and substance were not strong points of the display, but still no one could complain very much of deficiency in these respects. The majority were thick, substantial, useful-looking animals, losing much in appearance by the want of that finish and style which give to an animal the characteristics of good breeding. As a rule, they were in fair showing condition, certainly not over-fed, and they had a healthy lively look about them, which would contrast favourably with the somewhat stiff, sleepy, over-fed condition in which many English Shorthorns are exhibited. It was indeed pleasing to find so little pampering and dressing, and French breeders will show wisdom if they continue to keep clear of those damaging practices. It was noticeable that the prevailing shade of colour was lighter than one is accustomed to

see in a collection of English Shorthorns. Few were wholly red in colour, not very many dark roan, a good many pure white, and the large majority light roan. This, of course, is explainable by the extensive and systematic use of white bulls in France.

The French Shorthorn Section, divided into five classes, had no less than 522*l.* allotted to it as prize money; while, in addition, three supplementary prizes were awarded in four of the classes and two in the other, besides numerous tickets of commendation. The class for bulls under two years old contained 29 entries, fully one-half being really good, well-bred, promising bulls. A few were very plain, and showed little breeding and less skill in bringing them out. The first prize went to a lengthy, well-balanced, well-formed red and white bull, eighteen months old, shown and bred by Count de Massol, of Souhey, Côte d'Or. This bull showed a slight want of character, which was increased by a bareness of hair, and he was also plain in the shoulder; but still he possessed many of the better points of a true Shorthorn, and was deserving of the position into which he was placed. His grandsire, "Tout Blanc," a famous French bull, traces back through Mr. Jonas Webb's "Duchess," by "Vanguard" (5545),* a daughter of Earl Spencer's, 'No. 6 Marmisole," and "Dedona," by "Alabaster" (1616), to "Favourite" (252), "White Bull" (421), "Bolingbroke" (86), and "Hubback" (319). Count de Massol showed two others of similar breeding in this class, one being a very neat and promising white bull, twelve months old. The second-prize bull, shown by Count de Falloux, of Bourg-d'Iré, Maine-et-Loire, was neater in form than the first-prize bull, and had excellent front and neck-vein, but lacked hair and substance. Through "Young Primrose," by "Pilot" (496), this neat little bull's sire runs back to "Flora," by "Young Comet" (157). M. Lacour, of Saint-Fargeau, Yonne, came third with a shapely little yearling bull, red and white in colour, with good rib, very strong loins, and fine quality. Through "Autumn Rose," by "Vatican," he traces back to the best of Mason's and Colling's blood. One of the most handsome, most promising, and best-haired bulls in the lot got only honourable mention, namely, "Lord Derby," a neat thirteen-month roan, got by "Sir Olive Barrington" (35,384), and owned by M. Cazenove, of Idron, Basses-Pyrénées. This was the highest price bull, and was sold for 120*l.*, to go to Italy.

Bulls over two and under four years old numbered 22, and were a good lot. A few were very plain, and there were no stars of the first magnitude. The majority were heavy, fairly-

* The numbers within brackets, thus ( ), refer to 'Coates's Herd Book.'

formed, useful-looking bulls, showing moderate quality and fair substance, but lacking style and character. A good many were also a trifle long in the limbs and light in the flanks, while hair was even more scanty here than in the younger class. Count de Massol won the first prize here also, with a three-year-old bull, bred similarly to the one which came first in the young class. His form and general characteristics were also very similar, but he was lighter in colour, rather neater about the shoulders, very even all over, and, except that he stood too high above the ground, he was indeed, all round, a thoroughly good Shorthorn. The Marquis de la Tullaye, of Ménil, Mayenne, came second with a large, heavy, fairly shaped three-year-old roan bull, showing plenty of substance and fair quality. The sire of this bull—"Roan Bull" got by "Prince Regent" (24,857), and out of "Princess Pearl," by "Prince Pearl" (29,764)—was imported to France from Mr. F. Fowler, Henlow, in 1875; while his dam traces back through "Rachel," by "Reveller" (8430), to "Jane," by "Monk" (2266), and "Rufus" (570). Following closely upon this one came a very handsome roan bull, three years and ten months old, owned by M. Morisse, of Bretteville, Seine-Inférieure. One of the neatest in the class, this bull claims descent through "Hero," by "Hartforth" (3986), from "Marske" (481), and "Comet" (155), of which bull there is a double cross in the pedigree. The fourth-prize bull, a very promising animal, two years and four months old, exhibited by Count de Falloux, is half-brother to the Count's second-prize young bull, and is got by "Tric-trac," who claims an excellent English pedigree, including, among others, "The Beau" (12,182), "Duke of Cornwall" (5947), "Prince Ernest" (4818), "Phenomenon" (491), "Favourite" (252)—double cross—and "Hubback" (319). Heavier, and better fleshed than this bull, but older—by a year and a half—and not quite so stylish, was the fifth-prize winner. Exhibited by M. de Villepin, Sarthe, he traces back, through "The Baron" (9711), and "Gleaston Castle Bull" (6040), to "Wellington" (686), and "Favourite" (252).

The class composed of heifers under two years old—27 in number—showed better quality and more character than any of the other classes in the Section. Compared to the older classes, it exhibited substantial improvement, particularly in regard to character, but also in a slight degree in quality of flesh and in other respects. It is an undisputable truth, however, that good heifers are much more numerous than good cows. M. Auclerc, of Allichamps, Cher, headed this class with a very promising red and white heifer, twenty-two months old, descended on her dam's side, through "Columbus"

(12,616), from "Miranda," by "Regent" (544), and "Jubilee," by "Prince" (521). A very handsome nineteen-month heifer, roan in colour, showing perhaps better breeding than her more fortunate opponent, and owned by M. Tiersonnier, of Gimouille, Nièvre, made a close second. Got by "Noble Oasis," this fine heifer is descended from a tribe that has had a long and successful career in France, and that traces back, through "Young Matcham" (4423), and "Rose's Red Bull" (5009), to "Turnell's Red Bull" (1536). His dam traces through "Baltic" (12,431) to "Pilot" (496), "Orpheus" (473), and "Favourite" (252). The third-prize heifer, owned by M. Gardye de la Chapelle, of Farges-Allichamps, Cher, claims descent, through "Third Duke of Athole" (12,734), from "Young Remus" (2522) and "Bolingbroke" (86). Count de Massol had in this class to content himself with the fifth prize, the winner of which was a neat, stylish, thirteen-month heifer, got by "Turenne," the sire of the first-prize young bull, and out of a cow whose family has long been in France, and claims descent, through "Little John" (4232), from "Flora," by "Young Comet" (157).

Heifers, two and three years old, were grouped in one class, and numbered about 20. The majority were very good, of fair size, well-shaped, and fairly bred, but among the lot were a few without much to recommend them. Count de Falloux came first here with a three-year-old roan heifer, got by "Trictrac," and out of a cow tracing, through Earl Spencer's "Tinker" (8710), and "Duchess," by "Belvedere 2nd" (3126), to "The Paddock Bull" (477). Large in size and evenly fleshed, this heifer lacked style and character. A somewhat common-looking three-year-old roan, owned by the Marquis de la Tullaye, and got by Mr. Fowler's "Roan Bull," out of a cow tracing, through "Reveller" (8430), to "Rufus" (570), was placed second; but in preference to her we should have taken three or four others that were placed further down the prize-list. M. Salvat, of Saint Claude, Loir-et-Cher, came third with a three-year-old roan heifer that, in our opinion, was the best specimen of the Shorthorn breed in the class. Her sire traces back, through "Sir Richard" (15,298), to "Favourite" (252) and "White Bull" (627); while her dam claims descent, through "Favourite" (8066), from "Fisher's Bull" (2022). The fifth-prize heifer, a handsome two-year-old roan, is related to Count de Falloux's first-prize heifer, and was got by a bull descended, through "Wiseton" (11,054), from "Pope" (514) and "Chilton" (136).

The cow class was by far the largest in the Section, containing, as it did, about 40 animals. In so large a class there was room for variety, and it is but right to say that a

good many could claim but few strong points. The want of style and true Shorthorn character, already spoken of, was more noticeable here than in any of the other four classes; but while this was the case, it must be admitted that, in regard to the size and substance of the animals, the muster of cows was a very strong one. The majority were strong, massive, useful, but common-looking animals, healthy and active in appearance, but lacking the style and gaiety which usually characterise the display of Shorthorn cows at the English national Show. M. Després, of la Guerche, Ille-et-Vilaine, came first, with a good four-year-old roan cow, M. Salvat following closely with a five-year-old roan. M. Lépine, of Rouez-en-Champagne, Sarthe, won the third prize with a four-year-old roan cow, showing fair style, and out of a cow descended, through "Lexicon" (7139), from "Marske" (418) and "Comet" (155), of which latter bull there is a double cross. A large but rather common-looking five-year-old cow, owned by M. Daudier, of Naifles, Mayenne, came fourth. She claims descent, through "The Baron" (9711), from "Wellington" (686), and a son of "Favourite" (252), of which bull there is a double cross. M. Tiersonnier won the fifth prize with a red and white cow, three years and five months old, out of a cow got by "Baltic" (12,431), and tracing back, through "Morning Star" (217), to "Orpheus" (473) and "Favourite" (252). A sixth prize went to the Marquis de la Tullaye. In addition to three supplementary prizes, no fewer than eighteen tickets of "very honourable" and "honourable" mention were awarded in this class, so that more than one-half of the forty animals entered carried tickets of distinction over their heads.

One of the largest cows in this Section girthed 7 feet 9 inches; another, less in size, 7 feet 3 inches; and another 7 feet 2 inches. One three-year-old bull girthed 7 feet 9 inches; another, of the same age, 6 feet 6½ inches; and a two-year-old bull, 6 feet 11½ inches. In taking leave of this part of the subject we would say, in a sentence, that France has proved itself admirably adapted to the rearing of Shorthorns, and that the very slight deterioration which the breed has shown since its introduction into the country is perhaps more directly traceable to a want of knowledge and care on the part of the French breeders than to any defect in the soil or climate of France.

Native French Breeds.

Normandy Cattle.—Of these there were no fewer than 150 entries, and thus they formed the largest Section in the Cattle Department. The native cattle of Normandy have branched out

into several varieties, the principal being the Cotentin, the Bessin, and the Augeron. Collectively they present great variety of size, form, and colour, but it is claimed that, nevertheless, they "form a magnificent race of cattle, robust and well-conditioned, notable for their remarkable milking qualities." The prevailing colour is brindled, some being black, and some red. As a rule they are keen in the temper, rather high on the leg, rough and big in the bone, heavy about the shoulder and neck, flat in the ribs, and too quickly "rounded off" in their contour. During recent years they have been considerably improved, mainly by increased care in breeding and rearing, but partly also by a slight admixture of Shorthorn blood. It cannot, however, be denied that there is still room for further improvement. The Shorthorn cross has had a very marked effect. It has shortened the legs, diminished the bone, greatly increased the quantity of flesh, and has not decreased the yield of milk. The majority of the Norman breeders, however, are not willing to admit the desirability of going beyond their favourite breed for any improving influence. Indeed they stoutly deny it. But when we add to the deficiencies already noted the fact that the Norman cattle are six years old before they are "properly fit for the butcher," impartial outsiders will at once see the advantage that would arise from extensive crossing with the Shorthorn. It is contended that the meat of the Normandy cattle is superior to that of the Shorthorn; but any advantage in this respect is due mainly to the fact that they are fed exclusively on grass, and are not "forced," as many Shorthorns are. The strongholds of the Norman cattle are the departments of La Manche and Calvados, but it is asserted that they are used more extensively outside their own locality than any other French breed. In the departments of Orne, Eure, Lower Seine, Eure-et-Loir, Seine-et-Oise, Seine-et-Marne, and Seine, they are to be found in large numbers, while the dairies of Paris and the surrounding district are mostly stocked with Norman and Flemish cows. The beef of Norman cattle also forms an important element in the meat markets of Paris, where it enjoys a high reputation for its quality. Though they are slow in growth, the size attained by oxen is sometimes enormous. They have been known to exceed 35 cwt. each, or about 15 cwt. above the average weight of fully matured oxen in the London Christmas Fat Stock Show.* It is for its value in the dairy, however, that the Norman breed has acquired most fame. The milk of the Norman cow has perhaps no equal in the production of butter. The butter of Isigny, in Calvados, and that of Gournay, in the Lower Seine, which have all along won the

* Mr. Richardson states that a hundred thousand grass-fed beasts leave the fine Norman pastures every year.

leading honours at the great annual Paris Butter Show, are made from the milk of Norman cows; and so are the famous cheeses of Camembert, Livarot, Neufchatel, &c. To show the importance of the butter industry in France, it may be mentioned that in 1874 France exported 740,000 cwts., value 3,600,000*l.*; and, further, as indicating the superiority of the milk of the Norman cows, it has been stated that the Isigny fresh butter often brings as much as 10*l.* 10*s.* per cwt. at Isigny, and from 3*d.* to 9*d.* per lb. more than any other at Rio Janeiro and elsewhere to which it is exported. This superiority in the quality of the milk of Norman cows is no doubt the main reason why their breeders are so reluctant to intermix the breed with strange blood; and if crossing is to become general, it certainly ought to be carried out with the greatest possible care.

Flemish.—This race, of which 84 specimens were shown in the French Division, is pre-eminent for milking properties. In the Departments of the North, of Pas-de-Calais, of Aisne, and around Paris, the Flemish cattle are kept in large numbers, and are regarded as a profitable kind. Deep-red in colour, they are described in the French Catalogue as animals of great weight, with splendid conformation, fine skin, neat head, true outline, good rump, neatly attached tail, but narrow chest and flat ribs. It is also stated that recently the breed has been improved both in its milking and beef properties by judicious selection in breeding. Mr. Richardson states that in Flanders, which is almost wholly stocked with Flemish and Dutch cattle, the former fatten much more quickly than the latter; and he mentions that it is a general practice among farmers there to take one, two, or three calves from cows of the breed and then prepare them for the butcher. The large majority of the male calves of the Flemish race are slaughtered for veal, few more being allowed to grow up than are necessary for the maintenance of the breeding herds. Crossing with the Shorthorn has been frequently tried, and indeed is constantly practised to a slight extent; but it is asserted that while the cross improves the cattle from a butcher's point of view, it depreciates their milking properties. The annual produce of milk from a good Flemish cow is stated at about 2600 litres, or a little over 4300 English pints. For a considerable time after the cow has dropped her calf the daily yield is very often about 25 litres, or close on 44 English pints; in some exceptional cases even as much as 30 litres, or a little over 52 English pints.

The breed was very well represented, and had the coveted honour of carrying away the 2500 franc (100*l.*) prize offered for the best group of milk-producing cattle. This group was exhibited by M. Bosse, Director of the Asylum of Bailleul,

Nord, and was clearly enough deserving of the high distinction awarded to it. Several of the young bulls were fairly well put together; but the old bulls, as a rule, were not so nice, from an Englishman's point of view. Their ribs were very flat, frames narrow and not very even, muzzles black or spotted, and horns black, pointed, and sometimes long. Most of them were soft and free under the hand, and exhibited fair quality of flesh. The females, as with almost all heavy milking races, were much more handsome in appearance than the males, and finer in bone. A good many, however, were narrowly "made-up," and very light in the middle. The first-prize animal in the young heifer class, looked more like a Shorthorn cross than a pure Flemish, and did not show a satisfactory development of the milk vessels. The first-prize cow, owned by M. Bruyer, of Albert, Somme, was symmetrical, with straight top and fair quality. She was by far the best of the lot. Some of them were high-standing and long in the legs, others being narrow in front and slack on the back.

On the whole, of the two valuable breeds so popular in the north of France, the Flemish and Dutch breeds, the majority of English farmers would perhaps, in point of general utility, give the preference to the latter. It may also be stated that it was asserted by many competent judges, men well acquainted with both breeds, that had the Dutch breed been as fairly represented in the group contest as the Flemish, the Dutch would have won the 100*l.* milk prize. There is a sort of friendly rivalry between the votaries of the two breeds, which, as is invariably the case, has evidently resulted in good to both.

Charolais.—Of all the many different races of cattle in France, the Charolais is perhaps the most handsome, and in regard to value or importance is equalled only by the Norman breed, if indeed by it. Hailing originally from Charolais and Brionnais, this breed has spread over the greater part of the centre of France; and in its march it is gradually displacing all other breeds. The truest specimens of the Charolais breed are to be found in the Brionnais district, but the finest specimens of cattle passing under the name of Charolais are reared in the Nivernais, into which region the breed was introduced from Charolais about a hundred years ago. The breeders in the Brionnais, proud of their native cattle, have carefully guarded it from all foreign influence, good and bad, and thus in that part the faulty and the good points of the breed have been preserved and developed alike. In the Nivernais and other districts which have adopted the race, the breeders have been rather less zealous as to its purity, and the result has been a wonderful improvement in the structure and quality of the animals. So marked indeed has been the

improvement in the Nivernais, that the Charolais cattle of that country are distinguished by the name of Nivernais-Charolais. It is contended by some that this improvement has been brought about by the exercise of increased care in the selection of animals for breeding, and of better treatment in rearing. The most generally accepted explanation, and probably the most correct one, is that the improvement is due mainly to an infusion of Shorthorn blood. It is evident, from what we have ascertained, that very substantial improvement had been effected in Nivernais and elsewhere by careful selection of sires and good treatment; but it is equally clear that it is since the crossing with the Shorthorn, commenced in Nivernais (only recently), that the improvement has been most rapid and most marked. Writing of the Paris Show in 1877, M. de la Trehonnais, a recognised authority, says: "The most striking part of the Show was, in my opinion, the marked improvement evident in the Nivernais cattle. It is whispered that this is owing to an infusion of Shorthorn blood. I know nothing as to this, but I say with pleasure that I have never seen such an assemblage of fine Nivernais cattle as those which formed, undoubtedly, one of the chief ornaments of the Show." The Charolais cattle being always white in colour, the greatest possible care must of course be exercised in the introduction of Shorthorn blood. It is not enough that the Shorthorn bull selected should himself be pure white; it is also essential that he should be descended from a tribe whose characteristic colour is white. It will thus be easily imagined that crossing with the Shorthorn has not as yet become very general or very extensive. There is now, however, a certain and growing demand for white Shorthorn bulls for mating with Charolais cows, and it is pleasing to know that systematic efforts are being made to meet that demand. The French writer, already referred to, states that M. Colcombet, a farmer in the Bourbonnais, where the Charolais breed prevails, has set to work to build up a herd of white Shorthorns. "He started," the writer says, "by buying the whole of the twenty-two volumes of the 'English Herd-Book,' and every volume of the French; and, with the patience worthy of a Benedictine monk, he traced back from generation to generation the accidents of colour in each family. With the knowledge thus laboriously acquired, he was able to select his stock with such certainty that the most perfect success has rewarded his toil. He is now somewhere about his fortieth calf, each perfectly white, without a single hair of red or roan appearing in any of them to upset his calculations or betray his hopes." At the Exhibition we had the pleasure of meeting M. Colcombet, and were glad to learn that his praiseworthy industry is still being rewarded with unbroken success. Up to

this time he has devoted his attention mainly to the establishment of a pure white colour in his herd; and having successfully accomplished that, he now intends to look more than he has hitherto done to the form and quality of the animals. There is every prospect of all the bulls he can rear being purchased at fairly remunerative prices. At present he sells them, when from six to twelve months old, at from 20*l.* to 25*l.* a head.

But to return to the Charolais breed. The hair is short and sleek; body well-balanced and cylindrical; head short and thick; horns rather long, white, wide, and rising towards the point; muzzle white; eye large and bright; countenance pleasant; hind-quarters broad, but slightly deficient and rough on the rump; ribs fairly sprung; back a trifle slack; chest broad and pretty deep; shoulders rather big. The race has all along been regarded as one of the best for work in the country, and it has been very extensively used for that purpose. It is therefore natural to expect that, despite the so far successful efforts that have been made to improve the breed, slightly coarse shoulders should still remain one of its characteristics. The tail is not neatly set on, indeed it comes out too soon; from the hooks backwards there is a need of making up; the thighs should come down a little further; the back should be broadened a little, and the ribs slightly better sprung; the bone is big, and the head a trifle clumsy; and the quality is not exactly what could be desired. As a rule these defects were much less apparent among the females than among the males, and still less among some of the younger females, in which latter a likeness to the Shorthorn was easily recognised. A comparison between some of the older cows, which were pointed out to us as being the truer specimens of the old Charolais breed, and a few young females showed an unmistakable leaning towards the Shorthorn type. Some of the heifers, for instance, displayed as neat heads and horns as any breeder of cattle could wish to see, and had also finely laid-in shoulders, well-sprung ribs, moderately even quarters, fine bone, and excellent quality. It is asserted as the main objection to the extensive use of Shorthorn bulls among the Charolais breed that the influence of the Shorthorn impairs the working powers of the Charolais. As to that we are scarcely prepared to speak positively; though we are inclined to think that the improvement which the Shorthorn bulls effect in regard to the production of beef, should be at least equal to any loss which might be caused in working power. An animal with good beef-producing qualities, and fair working powers, should be more valuable to all interested in it than one good for work and fair for beef. We have seen few breeds of cattle better fitted for crossing with the Shorthorn than the Charolais.

Its defects are such as the Shorthorn is pre-eminently fitted to remove. No breed of cattle has ever proved itself so effective as the Shorthorn in the improvement of other breeds, particularly as regards the hind-quarters, head, rib, bone, and quality; and these are the very points in which the Charolais need slight improvement. It is evident that some breeders have already made successful efforts in this direction.

While justly held in high esteem for its working powers, the Charolais breed stands unequalled among the French races for its value from a butcher's point of view. The quality of its meat is regarded among Frenchmen as superior to that of the Shorthorn; the animals grow to a great size, and mature at a satisfactory pace. During the last few years the Nivernais-Charolais animals have been carrying off the lion's share of the prizes at all the more important Fat Stock Shows in France; and in some cases have beaten specimens of the pure Shorthorn breed. In his admirable work on 'The Corn and Cattle-producing Districts of France,' Mr. Richardson gives the following result of the fattening of four Nivernais-Charolais oxen, bred and fattened by M. de Béhague :—

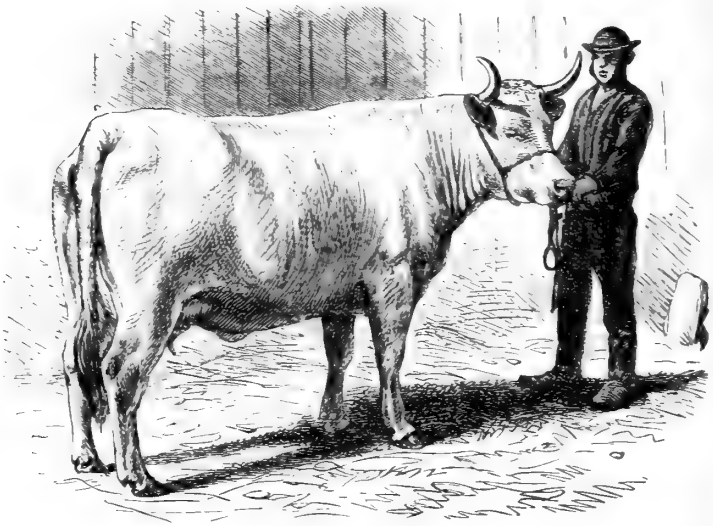
	Weight at Birth.	Age at Sale.	Weight at Sale.	Increase per Month.
No. 1 ..	66 lbs.	31 months.	1,478 lbs.	47¾ lbs.
„ 2 ..	70 „	36 „	1,987 „	55 „
„ 3 ..	68 „	37 „	1,893 „	51⅛ „
„ 4 ..	64 „	40 „	2,079 „	52 „

It is stated that these animals were treated from their birth as being intended for the butcher, and that they were fed in summer, in covered yards, upon lucerne, clover, and green maize; in winter, in stalls, on hay, mangold, cabbage, and rutabagas. No. 1 was sold when just fat enough for the butcher, the others when fully matured.

The Section filled by the Charolais breed was one of the most attractive in the French division, and drew large crowds of admirers. We fully agree with M. de la Tréhonnais when he says that it is "in lots that the Charolais race shines out the best," and that, "examined separately, the Charolais, even the best of them, are less admirable." A finer sight of the kind we have seldom seen than was presented by the long rows of handsome pale-white Charolais cattle at the Paris Exhibition. In Scotland we are accustomed to see still more symmetrical displays of glossy blacks, but a sort of novelty hung round the white rows at Paris, which gave a pleasing aspect to the sight. In the class for bulls under two years old there were eighteen entries, and the four prizes and first two honourable mentions went to animals from Nièvre. Of the second-prize cow

we are able, through favour of her owner, M. Clair, to give an illustration (Fig. 1). She is five years of age and girthed, at the Exhibition, 6 feet 11 inches. The photograph from which our figure is given was taken nearly two months after the Cattle Show was held; and M. Clair states that, as she had been on moderate pasture during that time, she had lost bloom a little.

Fig. 1.—*Charolais Cow, Five Years Old, the Property of M. Clair.*



The representation, however, though barely doing justice to M. Clair's cow, gives a pretty correct idea of the characteristics of the better specimens of the Charolais breed. The thick substantial body, strong fore-arm, rather big bone, short legs, flat rib, badly-set tail, and rather long horns, are all indicated. This animal's head is much finer than that of an average specimen of the breed, and so are its underline and quality. Indeed, she handled as well as could have been wished. M. Clair also exhibited in this class a six-year-old cow, which was pointed out to us as one of the truest specimens exhibited of the old Brionnais-Charolais. She was even rougher than the others on the hind-quarters, and particularly about the tail-head; had long horns, rather long face, very rough shoulders, and deficient neck-vein. She girthed 6 feet 11½ inches, and had good flank. For his very fine collection of the breed M. Clair was awarded a special prize of an "object of art"—an honour which every one who saw his splendid group turned out would

at once admit he well deserved. In a letter we received from him he says:—

"The *élite* of this race is centered in this locality, but it occupies a great part of the centre of France, extending over the Departments of Nièvre, Allier, and Seine-et-Loire, and branching into Cher and Yonne. The improved race is called the Nivernais-Charolais. The stock, it is true, came from Charolais; but since coming to Nièvre, the breed has been so much modified and ameliorated in the form of the animals and their aptitude for work and fattening, that they are now completely transformed. The best specimens of the Nivernais-Charolais are now very much sought after, not only by Frenchmen, but also by foreigners. The Germans, in particular, take away a number of our best young stock, to be re-sold in their own country by the agricultural societies. Some are also bought for the French colonies. The merits of the race being now fully recognised, prices have risen greatly. Choice cows and heifers sell at from 1000 to 2000 francs—from 40*l.* to 80*l.* a head. The bulls are usually sold at the age of from eight months to a year, and bring prices ranging from 800 to 3000 francs—32*l.* to 150*l.* I sold a bull of my own breeding for 4800 francs—232*l.*—at the age of 11 months. An annual sale of bulls has been instituted at Nièvres, and is held in February. From 200 to 300 bull-calves are usually sold there."

The cows are only moderate milkers, but it is maintained that the Shorthorn cross effects a slight improvement in this respect. Though all seemed pure white in colour, and without spots of any kind, a good many exhibited two strange, sand-coloured, waiving lines running one on each side of the backbone. They are from six to twelve inches apart, and stretch from the tail-head to the shoulder-top. The lines could be seen only when viewed narrowly, but, once caught, could be traced quite distinctly. This is jocularly said to be a "harking back" to *lines* that were.

Gascon and Carolais.—The first of these two races is to be found in the largest numbers in the district of Carolles, in Upper Ariége; and the second in the Department of Gers. Both are derived from the Swiss cattle, and still present many points of similarity to the parent stem. Their leading quality is aptitude for work, at which they are very enduring. They are very strong and healthy, and are frequently preserved to the age of fifteen years. Their body is cylindrical and even, their chest broad and deep, bones coarse and strong, muscular development great, tail very high at the source; colour usually a sort of grey, sometimes a sort of dun, and often tinged with black. The cows are fair milkers, and the quality of the beef is good. It cannot be said, however, that they are valuable, or indeed profitable, butchers' cattle. They exhibit too much bone, too much muscle, and too little flesh and quality. The section contained twenty specimens, the majority being of the Gascon variety. They were, as a whole, perhaps barely so large as the Swiss, but, on the other hand, were a trifle neater.

Garonnais.—This sort is most numerous in the basin of the South Pyrenees. It is divided into two varieties, the one occupying the valley of the Garonne, and the other the higher-lying lands. The former is the more valuable and nicer of the two, but the latter is more enduring at work. Indeed, the race is held in high esteem for its working powers, being strong, quiet, and docile in temper. The cows are poor milkers; and, though they are not difficult to fatten, the breed would have to undergo great improvement before it could stand high in a butcher's estimation. The quality of the beef is good, but muscle is too plentiful. In regard to this latter point, however, there is less room for complaint in the case of this breed than in most of the other Continental working breeds. Forty-three specimens were exhibited, and the uniformity in colour and general appearance was very marked. The prevailing colour is a sort of light dun, or "wheat-colour," as it is called in the official Catalogue. The body is long and of fair size; the head neat, but rather thick; horns short and neat; muzzle white; bone finer than that of most of the other working breeds, but still a little too strong; neck and fore-arm powerful; top straight; ribs short and flat. Under the hand they are soft, free, and spongy, and thus they grow in one's favour by close inspection.

Bazadais.—This race takes its name from the Arrondissement of Bazas, in which it has been most largely reared. It has spread in considerable numbers into the Departments of Landes and Gers, and into different districts of other neighbouring Departments. In colour the animals are similar to Swiss cattle—dark dun, with light-coloured stripes along the back. Of fair size, the body is even and proportionate, but hardly "pointy" enough. As a rule they are well spread in front, and have better thighs and haunches than the average of Continental breeds; but their ribs want spring, their backs all along should be broader, their neck and head are too thick, horns are long and coarse, and tail-head is high. Their faces are often dark in colour, and muzzles spotted. The eye is fiery and wild, and the general appearance of the animal lively. The bulls, as a rule, are ferocious, and have to be carefully handled. The cows are evidently poor milkers; but the quality of the beef is excellent. The quantity is deficient, but would be increased and the breed greatly improved in every respect, we should think, by the infusion of a little Shorthorn blood.

Femeline.—This variety, which belongs to the "type comtois," has its principal centre on the borders of the Doubs and the Saône. Its colour is light dun, sometimes approaching white, or "wheat colour." The head is fine, horns long and thin, eyes far apart, neck slender, chest narrow, body long and slim, legs short

and fine, skin fine and supple, and tail-head high. The general appearance is sprightly, but there is a want of weight and substance. The cows are good milkers, the daily yield for some time after calving being from 15 to 18 litres, or from 26 to 32 English pints. For moderately light work the Femeline oxen have few equals, being active, durable, and docile. The breed is easily kept, but fattens slowly. Its value to the butcher is not very great. The breed was largely and very creditably represented, 57 specimens having been entered. In these classes, also, we thought more of the females than the males. We think, however, that the country which this sort occupies might be stocked with a better race of cattle.

Pyrénées.—In this Section no fewer than six different varieties were represented. Of the *Lourdes* race, which was shown by itself, 12 specimens were entered. Its head-quarters are in the valley of Argeles, in the High Pyrénées, and, being the best milk-breed in that part of the country, the dairies of Tarbes, Bagnères, and the principal towns in the south-west are supplied by it. Small in stature, the characteristic colour of these animals is pale-red, or similar to that of red wheat; the head is long and clumsy; horns rather long, and dingy white in colour; the neck thick, and shapes not very good. A three-year-old heifer of this breed, owned by M. Langlade, Pau, Hautes-Pyrénées, was a very tidy little beast—one of the beauties in the Section, indeed. Her head was neat and fine, and her form true and attractive.

The races of the valleys of the *Aure* and *Saint-Girons*, which are similar in characteristics, were shown together, the former numbering 6 and the latter 10. The Aure variety occupies the high valleys of the Pyrénées, and the Saint-Girons the district of that name. The latter is regarded as the mother of the Bazadais race, already noticed; and though the animals are small in size, they are symmetrical, good milkers, fair beef-producers, and very easily kept. The colour is, as a rule, a sort of grey, or similar to that of a badger, but is sometimes chestnut. They are not so strongly built as the Lourdes cattle, but enjoy a good reputation for dairy purposes. They are freely exported into the plains of Ariège, the high Garonne, the Aude, and Hérault. The Aure cattle are not quite so fine in form, nor such good milkers, but their hair is of better quality and is lighter in colour.

The *Bearnais*, the *Basquais*, and the *Urt* varieties, all belonging to one family, were joined in competition, the first numbering 5, the second 4, and the third 3. They are pretty much alike in form and general characteristics, almost the only difference being in colour and in the length and form of the horns.

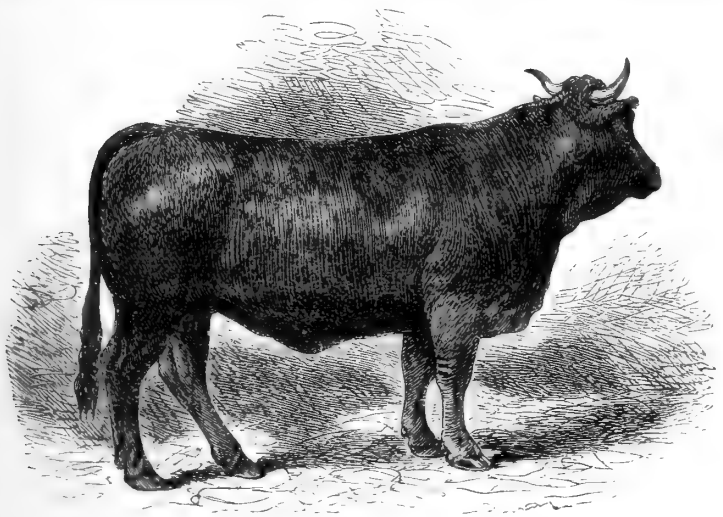
They are gay prim-looking animals, shapely, and very lively; their colour is usually red, variously tinted. Their predominant quality is aptitude for work, the cows being used mainly for that purpose. They are poor milkers, but their beef is greatly esteemed for its quality, and contributes largely to the meat supply of Bordeaux. They are reared chiefly in that part of the Pyrénées between Saint-Jean-de-Luz and Cauterets. The prizes were about equally divided among the three varieties.

Limousin.—The Limousin breed is one of the most important in France. Excellent workers, they carry a large quantity of good beef, and are massive substantial animals. Their head-quarters are in Haute-Vienne. Of medium height, they are dun in colour, or, as the official Catalogue has it, coloured like "red wheat;" the head is moderately fine, and well proportioned; the muzzle is white, and surrounded, like the eyes, with a light-coloured rim; the horns are white, strong, and gracefully bent upwards; the neck is rather thick, and not tapering enough; the forearm is powerful, and well spread; the chest is deep, strong, and stretching far forwards; the back is straight, strong, and long; the crops are excellent; ribs are pretty well sprung; the tail sits high and open; thighs are thick, but rather round; limbs are short, very strong, and well covered with flesh and muscle. No breed in the Exhibition showed a stronger or more uniform family stamp. In colour and form they were all after one pattern, and made up a very attractive and imposing display. Their predominant qualities are stated to be "sobriety, aptitude for work, and precocity in fattening." It is evident that the most prominent of all their qualities is their working powers. To these, however, they add good beef-producing properties, though in this respect considerable improvement is desirable. For beef-makers the bone is not fine enough, and the muscular development is too great; the neck is rather clumsy, skin a little thick, the quarters are rather round, the tail is badly set, and the quality slightly deficient. Possibly, improvements in these respects would, to a certain extent, impair the working properties, which in France are of great importance. We, therefore, sympathise with the caution which the Limousin breeders, as well as the breeders of some other French cattle, are exercising in the improvement of their valuable native cattle, and their reticence in admitting foreign blood of any kind. But, without going beyond this breed itself, very substantial improvement might yet be effected in all the defects mentioned. No doubt a good deal has already been accomplished in this way; but, judging from Arthur Young's description of Limousin oxen, written at the end of the last century, it is evident that the

improvement of the Limousin breed in recent years has not progressed as it ought to have done. Young says that the form of these oxen was beautiful, "their backs straight and flat, with a fine springing rib, clean throat and leg," and that they were very well fattened. Mr. Richardson states that attempts have been made to increase the size of the breed by a cross with a more southern race, the Agenaise; but adds that it "had been successful only where the pastures and general feeding are exceptionally rich." Crossing with the Shorthorn has also been tried, and is still being pursued to a slight extent, and, from a beef point of view, the result has been most satisfactory. The crosses, however, are said to be neither so good workers nor so well suited to that part of France as the pure Limousin; and it seems that for a time at least improvement must proceed from selection in breeding.

It is worthy of note that in Limousin the cows accomplish the home labour, and that the bullocks are sold when from a year to eighteen months old, and are moved into other parts of the country, where they are first worked and then fattened for the butcher. The cows are model workers, but only moderate milkers. Many of these can do little more than rear their calves.

Fig. 2.—*Limousin Cow, Five Years Old, the Property of M. Caillaud.*



At the Exhibition the breed was very creditably represented, both as to numbers and quality. The entries were 69, and a group belonging to M. Caillaud, Chatenet-en-Dognou, Haute-

Vienne, who showed a lot of very fine specimens, won the 2500 francs (100*l.*) offered for the best group of any working variety. So much has already been said as to the general characteristics of this breed, that it would be a needless waste of space to transcribe the notes we have in our note-book referring to the individual animals exhibited. Through favour of M. Caillaud, we are enabled to give a representation (Fig. 2, p. 219) of his handsome five-year-old cow, which won the second prize in her class. The first prize in the cow class was awarded to a very fine, thick fleshy cow, with excellent front and crops, belonging to M. Léobardy. M. Caillaud's cow, here illustrated, is quite a representative specimen of the breed.

Salers.—Belonging originally to the group of the mountains of Auvergne, in which it occupied the central plateau, the Cantal of the Puy-de-Dôme, and neighbouring Departments, the breed of Salers has long held a prominent position among the herds of France. It is mentioned by Mr. Richardson as the only one considered really good "all round, for work, for milk, and for meat"—a distinction which attaches to it more than ordinary importance. Its characteristics are striking, and the family "current," we should think, exceedingly strong. The colour is dark red, usually marked with white spots on the belly. The head is triangular in shape, the face being long and full, and thickly covered with curly hair; the muzzle is black; the horns are turned upwards in a strange manner; the body is long, and wanting in depth; shoulder and neck are powerful; dewlap is very large; top straight, but narrow; ribs are short, and a little flat; tail is pretty neatly set, just a trifle high; flank is light; twist and thighs are very round, and not heavy; bone rather strong, but finer than that of the Limousin; great muscles, long legs, and general appearance lively and durable. The outline, on the whole, is tolerably good; and perhaps the general form resembles that of the Shorthorn more closely than that of any of the other French breeds, excepting the Charolais. The frame of the Salers, however, is too narrow, and too far from the ground. It is stated that in the plains of Limagne and in the east the breed shows different colours—piebald, dapple, red, black, and chestnut; and that in Limagne the body is thicker, and the legs shorter. The family stamp, however, is well defined all through.

For activity, endurance, and force at work they have very few equals, and are surpassed by none. At certain kinds of heavy work the Limousin, a thicker, lower-set race, might have the advantage, but for ordinary farm labour preference may be given to the Salers. True, the Limousin beat them in the contest for the 100*l.* prize for the best working group; but we were

assured by several French farmers, well acquainted with both breeds, but not directly interested in either, that had the two breeds been equally well represented by the respective groups the trophy would have gone the other way. All the animals exhibited in the group had to be bred by the exhibitor, and with that condition it is often very difficult to muster a fairly representative group. The milking qualities are good; for beef-making the breed stands high.

The entries of Salers numbered 81, and in point of average merit the display was very creditable. In some respects, particularly in hair, the Salers cattle present a slight resemblance to the Herefords of England, with which race, we should think, they would mate admirably. The Hereford would give them what they so much want, breadth and depth, and would also increase their covering of flesh.

D'Aubrac.—This variety, said to have had its origin in the mountains of Aubrac, is reared most extensively in Aveyron and Lozère, as well as in part of Cantal. The animals are powerful steady workers, and fair producers of beef and milk. It is stated that they are usually kept in the high lands till about three years old, when they are removed to Lozère, where they are worked for three or more years, and then sent to be fattened on the famous pastures of Mézenc. They contribute largely to the beef markets of the south-eastern towns. The entries numbered 47, and the uniformity throughout the ranks was striking. In colour, which varied from a tawny to a silver-grey, and in form, which was superior to that of the average of Continental breeds, they displayed some resemblance to Swiss cattle. The horns were large and black at the points; head moderately fine; eye lively, muzzle black; neck thick; shoulders strong; dewlap large; fairly developed chest; body round, thick, and pretty even; tail-head rather high; skin variable; and muscles strong. The females were of rather better quality than the males, which is not saying a great deal. Some of the cows were symmetrical; one or two would have passed as good specimens of the West Highland breed of Scotland. True in the outline, the better class of cows handled softly, and were stylish with a fair coating of flesh. A few had lengthy well-covered quarters. One three-year-old heifer girthed 6 feet; while the first-prize cow girthed no less than 7 feet.

Mézenc.—The head-quarters of this variety, of which Mount Mézenc is regarded as the cradle, are in the Departments of Ardèche, Haute-Loire, and Loire. Twenty-nine specimens were exhibited, and in general features they strike one as being more powerful at work, and more robust and better milkers than the D'Aubrac race, but not quite so easily fattened. The colour

is usually clear light, or "wheat," red; the head clumsy; horns long and coarse; neck heavy; dewlap large; hair coarse; skin usually thick, but often free and soft; form of body only middling; back hollow; ribs flat; flank deficient; tail-head rough; loins weak; bone large; and quality not very good. A few of the females had a fair outline and a moderate covering of flesh. One of the largest of the cows girthed 6 feet 8½ inches. Though lighter in colour and rougher in form, their general appearance was not unlike that of the Aubrac cattle. They are said to be very robust, and it is claimed that the flavour of their beef is exceptionally fine.

Parthenais and its Branches.—This boasted breed of Poitou is considered by its votaries to be pure; while others maintain that it is nothing more than a cross derived from various Swiss races. Be that as it may, it is now pretty well defined, and deserves many of the good things as well as some of the bad that have been said about it. Mr. Richardson says, "carefully-tested experiments have shown that, of all the various breeds in France, that of Parthenay unites in the highest degree aptitude for work, quality of meat, and production of milk;" and that the "breed gives less offal than any other." The Parthenay cattle should be excellent workers, and fair milkers; and the *quality* of their meat, under proper feeding, ought to be good. In *quantity*, however, the meat is deficient, especially on those parts where the most valuable beef is found. There are three varieties, the Vendéen and Nantais being the more important. Cholet is the principal feeding centre of the Parthenay cattle; and hence in Paris these fat cattle are known as Choletais. Despite strenuous efforts to maintain the breed in its purity, the Shorthorn cross is gradually creeping into its ranks, and producing a substantial increase in the yield of beef, but a decrease in their endurance at work. In some parts the breed is used mainly for work, and in others principally for milk. The entries numbered 58, the majority being of the Nantais variety. The colour is usually very light grey; the head is thick and short, and the frame similar to that of the Aubrac race. The bone, however, is finer than in that race, the dewlap is less; but hollow backs are also more characteristic of it. As a rule they are high on the leg, and bare below. Our note-book says that the first-prize bull in the older class had more style than most of the others, but slack back, coarse hair, and stiff skin; and that some of the others should be good for work, but little else. The first-prize young heifer, of the Vendéen variety, was narrow in the frame, wanting in style, and big in the bone. The first-prize heifer, in the older class of the Nantais branch, was slim and red-deer-like both in colour and form, but had fair quarters, evenly laid

shoulder, and good under-line. The first-prize cow was one of the best in the Section, large, even, and well covered with flesh; but flat in the rib, and not sweet about the head and horn. The Nantais variety seemed the smallest in stature, but rather the neatest. The muzzles, as a rule, were black, the horns black at the point, and the ears long.

Tarentais.—This race belongs to the mountains of the Tarentaise (Alps), and, like most other mountain races, is distinguished for its powers of endurance. The cows are also good milkers; but to the butcher this variety possesses very moderate value. The colour is usually light grey, the bulls being described as "badger grey." The Section contained 52 entries and presented remarkable similarity of colour and general characteristic. Of moderate size, the animals stood on short limbs, showed firm build and plenty of muscle. The muzzle was perfectly black; the eye large and mild; horns short, thick and black; the neck thick and sometimes developed into a high buffalo-crest, and the body even and round; skin very thick; rough high tail-head; and the shoulders often prominent. Some had deficient quarters and thighs, others flat ribs, and most of them wanted quality and fineness of bone. Several of the females were neat in form and lively in gait, and handled fairly well.

Breton.—This is one of the most numerous breeds of cattle in France. It is also one of the most valuable; and it is stated that the inhabitants of the Province of Brittany, which of course is the home of the breed, are more dependent upon the produce of cattle than those of any other province in the nation. The pure Brittany cattle are very small in size, but very thick and fleshy; white and black in colour; head short, neck thick, and altogether their appearance is somewhat dumpy. Their most notable feature is their wonderful milking properties. The quantity given per day is not very large, not over seven quarts from a newly-calved cow, but the yield of butter is exceptionally high. The yield of milk sometimes exceeds seven quarts per day, but in these cases the quality is usually not quite so rich. Attempts have been made to increase the size and otherwise improve the Breton cattle by infusions of Ayrshire and Jersey blood; but the results were not satisfactory. The Shorthorn was next tried, and in this case the success was most gratifying. The size and general value of the breed as beef-producing animals were greatly increased, while the milking properties were but very slightly disturbed. Where sufficient food can be raised to do justice to the animals the Shorthorn crosses have become very popular, and year by year they are growing in favour. A large portion of Brittany is bleak and very cold in winter; and in these parts the crosses do not thrive so well as the native breed, which,

Mr. Richardson says, is so hardy that it would "live and thrive where any other sort would die."

Fifty-eight specimens of the Breton breed were entered. Many of the animals presented some resemblance to Ayrshires; but as a rule were smaller, and more round in form. They stood very close to the ground, and their girth in many instances was quite surprising. The first-prize bull in the old class, an animal three years old, and owned by M. Feunteun, Finistère, had rough quarters but fine quality. He girthed 6 feet, and measured in length, from the shoulder-top backwards, 4 feet 4 inches. The second-prize bull, about the same age, the property of M. Flock, girthed 6 feet 5 inches, and was about the same length; he had an excellent coat of flesh, and neatly laid-in shoulders. Some of the other bulls were good in front, though deficient behind. The females were, as a rule, rougher at the tail-head and still smaller than the bulls, but full of flesh and, on the whole, pretty creatures. The first-prize heifer in the older class, also owned by M. Feunteun, measured in girth 5 feet, length 3 feet 6 inches, and height 3 feet 3 inches. M. Flock headed the cow class with an animal larger than most of the others, and showing superior quality.

Other French Races.—In the Section formed of French breeds not "comprised in the foregoing categories," specimens of ten different races or sub-races were entered. Of the Comtois ten specimens were shown. One was a young bull, red and white in colour, somewhat like a cross between the Shorthorn and Ayrshire breeds, bare of flesh and big in the bone. Four were young heifers, similar to the bull in colour and stamp. The others were cows. The females had a masculine appearance, but some of them possessed fair outline, and carried a deal of flesh. Quality, however, was deficient. One first prize, and one second, and three tickets of honourable mention were awarded to this sort. Of the Morvandeau, six specimens were shown, and won two third prizes, one fourth, and one honourable mention. Red and white in colour, they showed strong bone, rough tail-head, and stiff skin. They were rather peculiarly marked, a white stripe running along the back and down behind, while the sides were pale-red. One of the cows was neat and compact, but very thick in the hide. A like number were entered of the Montbéliard variety, the prizes falling to their lot being one first and three seconds. They were also red and white in colour, variously marked, fairly shaped, but stiff to handle, and deficient in quality. Their faces were white, and in other respects they resembled a secondary lot of English Herefords. The Bourguignon numbered four, and received one first prize, which was awarded to a two-year-old bull that would have passed for a moderate speci-

men of the Salers breed. A young heifer, also red, had good outline, strong loins, but unsatisfactory quality. Three of the Meusien variety were entered; and one, a four-year-old cow, obtained a third prize. That animal was mostly white, with pale-red spots; it was large in size, moderately fine in the bone, and soft in the skin, though not fascinating in shape. The Bourbonnais race was represented by a yearling bull and a three-year-old heifer. The former, white in colour, had big flat horns, prominent shoulders, and an uneven contour. The heifer, first in her class, also white, resembled the Charolais breed in form. A like number represented the Maraichin variety. One was a red yearling bull, but not shapely. The other was a thirty-month red heifer, also of uninviting form. The Boulonnais numbered two—a thirty-four-month heifer and a five-year-old cow. Both were red and of inferior merit. One specimen of the Lorraine race was shown, a red two-year-old heifer.

Last, but not least, comes the solitary specimen of the Manceau breed, which, crossed with the Shorthorn, earned so favourable a distinction in the Cross-bred Section. This animal, a yearling bull, was exhibited by M. Cherbonneau, who also owned such fine crosses. Red and white, it reminded one of crosses between the Ayrshires and Shorthorns both in shade of colour and in general get up. Altogether this bull was above the average of English Shorthorns, among which he might have passed but for his Ayrshire shade of red. His muzzle was tinted with black, yet he was considered the best bull, and perhaps also the best animal in the Section.

French Cattle of Foreign Breeds (*other than Shorthorns*).

Ayrshires.—Of this valuable Scotch breed 13 specimens were entered in the French Division. Some were good and true, but a few were so large and rough as to suggest impurity of blood. The Marquis de Dampierre, of Plassac, Charente-Inférieure, came first in the young bull class with a little animal of fair outline, but light waist. The old bull class was headed by an animal which would pass in Scotland as an average Ayrshire. Several of the heifers were promising. The first cow, an excellent specimen, belonged to M. Marhin, of Pontivy, Morbihan.

Dutch.—This useful description of cattle has become very popular in France, and has proved itself well suited to the country. In the French Division 60 specimens of the breed were entered; and though the average merit was hardly equal to that in the Dutch Section of the Foreign Division, the breed was nevertheless very fairly represented. No appreciable difference

could be observed between the animals shown from Holland and those exhibited from France.

Swiss.—France exhibited 39 specimens of Swiss cattle. M. Broquet, of Void, Meuse, entered three of the Fribourgeois variety and one of the Bernois; none of them were very good. All the others were of the Swiss race proper, and were fair specimens.

Other Foreign Races.—In this Section only two animals were entered and one of these did not appear. The other was a fair yearling bull of the Glane breed, shown by M. Chemery, Morremont, Marne, and was awarded a second prize.

Cross-bred Cattle.

Shorthorn Crosses.—If further evidence were required to prove the wonderful ameliorating influence of the Shorthorn when crossed with other breeds, it was supplied in great abundance in the Cross-bred Sections at the Paris Exhibition. Attractive and interesting as many of the other French Sections were, that filled by Shorthorn crosses was in many respects the most interesting and entertaining. To Englishmen in particular, an inspection of these classes must have been gratifying in the extreme; for none could have failed to perceive the remarkable improving influence which had been exercised upon the animals by England's favourite breed. This Section was undoubtedly one of the chief features of the live-stock display, and should have unfolded many valuable lessons to Continental farmers. During the past 50 years more than 19,000 male and female Shorthorns have been in use in France; and while it is evident that in some districts this great influence has been well employed, it is equally clear that the country generally has not taken full advantage of it. A large proportion of French farmers seem to trouble themselves very little about the improvement of their cattle, bad as many of these are. Never having obtained a large revenue from the production of beef, they do not feel the want of it. Accustomed to look upon their cattle mainly as animals of labour, they content themselves with varieties, certainly valuable at work, but, for all other purposes, inferior to what they should and might be. Among those who think more and strive harder to advance their own interests and increase the wealth of the country, the desirability, or rather necessity, for great improvement in the French breeds of cattle has long been fully recognised. Those improvers, too, readily admit that on whatever French breed the Shorthorn has been used it has effected a substantial improvement, not only in its beef-producing properties, but also in its outward form and general quality. Many of them, however, contend that the Shorthorn impairs the working powers of the native breeds; and they also complain that the Shorthorn

crosses will not thrive properly under the same treatment, usually very careless indeed, as that bestowed on the pure-bred French animals. A slight deterioration in those working powers, which are prized so highly, seems to be regarded as of far greater moment than a large increase in the yield of beef. Anyhow, it is an indisputable fact that French farmers cause immense loss to themselves, as well as to their country, by maintaining and propagating inferior breeds of cattle, which are unworthy of the fertile country they occupy. The breeders of the better French races adduce with some force reasons for their reluctance in seeking to improve them by the infusion of foreign blood. Take, for instance, the breeders of the Limousin cattle. They glory in the striking uniformity and general good character which their favourite breed presents; and while they acknowledge the desirability of increasing the fattening tendency, they dread the introduction of foreign blood, lest it should result in the modification or even extinction of those family features. To a certain extent we sympathise with that caution; but we think much good might be done on the one side with but very little, if any, loss on the other. Herd Books ought to be established for all the more important breeds; and thus, while crossing might go on freely, a pure and unadulterated fountain would be maintained of each. In the northern counties of Scotland, where the Shorthorns and Black Polled cattle flourish side by side, the general cattle stock consists of crosses between these two breeds—animals superior for ordinary husbandry to either of the two pure strains—and yet this extensive intermixing of the two does not, and could not, in any way contaminate the parent streams. It is in the Western Departments of France that crossing with the Shorthorn has been pursued more extensively; and where, according to the official Catalogue, its "influence on agriculture and on the economical conditions of agricultural industry has been most visible."

The Section comprised no fewer than 93 animals; and contained crosses between the Shorthorn and twelve different breeds. It could not be said that success had been attained in every case; but, taking the Section as a whole, it exhibited a most decided leaning towards the male side. The variety in colour, size, form, and general appearance was great; but still all through, with very few exceptions, there was a stamp of the Shorthorn which could not be mistaken. It was, indeed, startling to contemplate the many rough and widely different tribes which had been the foundation on one side, and to think that a little foreign blood could have produced all the unformity and similarity that were apparent. It was not easy to ascertain how many Shorthorn crosses could have been registered to the credit of the

various animals; but the large majority seemed to be either first or second crosses, though in a few cases the crossing had evidently gone on for several generations.

The *Shorthorn-Manceau* carried off the lion's share of the prizes, and were, indeed, very excellent beef cattle. Eighteen specimens of this cross were shown, and no fewer than eleven prizes and four tickets of honourable mention were awarded to them. They showed an evenness, compactness, and quality which distinguished them from all the others. Some of them were rather small, and some defective in form; but, all over, they were so much superior to the others, especially in regard to fineness of bone and quality, that they could at once be recognised. The best specimens of this cross were shown by M. Cherbonneau, of Contigné, Maine-et-Loire, to whose lot fell one first and four second prizes, and two tickets of honourable mention. The Manceau race is stated to be one of the oldest in France, and to have at one time been the most numerous in the country. These animals are small but compact, and of fair quality. For his own herd M. Cherbonneau selects pure-bred Shorthorn bulls of considerable merit, and mates these with the best Manceau cows. During the last 20 years he has reared those crosses which gained him so much honour at the Paris Exhibition. He allows the calves to suckle for about six months, and afterwards sends them out to the pasture part of the day, and feeds them with cake in the house the other part. For seven months of the year he keeps his cattle out on the fields, but takes them in during the hottest hours of the day, and allows them green fodder and roots. Towards the month of December they are housed for the winter, and are kept in till about the month of May. Besides fodder, they are twice a day fed with cabbages, or something similar, and part of the time an allowance of cake is added. Water is supplied to them twice a day. The gem of this fine lot, which made so creditable an appearance in the contest for the beef-group prize, was a dark-roan heifer, which came first in the young class. Though only twenty months old she seemed almost fully matured, would have "dressed," perhaps, 7 cwts., and was one of the best butcher-beasts in the Exhibition. She was fine in the bone, broad and deep in the frame, neat about the head, grand in front, of very fine quality, and literally beef from head to heel. On the back she might have been stronger, but her straightness below fully made up for that. Though small in size and barely so even on the top, she reminded us of Mr. Stratton's handsome Birmingham champion of last year (1877). M. Cherbonneau was second in the bull class with a twenty-one-month white of fair size, good quality, and wealthy coat of flesh, but lacking character, though his head, horn, and shoulders were almost all that could have been desired. The others were thoroughly good

butcher-beasts. M. Parage, of Chaze, Maine-et-Loire, headed the cow class with a heavy four-year-old cow of the Durham-Manceau cross, well-clad with flesh of superior quality, but not very neat in form. M. Daudier, of Niafles, Mayenne, also showed a few very good specimens of this cross, finer in the bone than the average of the other crosses in the Section. It is evident that the two breeds blend together admirably. The characteristics of the Manceau, however, are giving way to those of the popular "red, white, and roan."

Eleven specimens of *Durham-Charolais* crosses were entered, and deserve to be placed next to the Manceau cross. They were awarded one first, one second, one third, and two fourth prizes, and two honourable mentions. In the class for bulls under two years old, Count de Massol, of Souhey, Côte d'Or, led off with a white that had better quarters than the pure Charolais breed, finer bone, better quality, and finer shoulders. He was a little round in shape, but would otherwise have passed as a very good Shorthorn. The Count was second in the corresponding class among the females with a stylish roan, rather too far from the ground, but neat, and true in outline. She was a little bare on the shoulder and on the thighs, and her horns came rather straight out. Her head was neat, and her rump and quarters were greatly improved from those of the pure Charolais. Again, in the class for two-year-old heifers he was fourth, with an animal displaying a good deal of Shorthorn character, while in the cow class the third prize fell to a plainish exhibit of his. M. Mativon, of Bannegon, Cher, was awarded the fourth prize in the old bull class for a very large three-year-old white bull, strong in the bone, bare on both sides of the tail, not heavy in the waist, and with rough horns; but neat head, white muzzle, good front, fair quality, and longer in the body than the pure Charolais.

Next to these would rank the *Shorthorn-Norman* cross, of which eleven specimens were entered. These were generally good animals, and had a fair share of the prizes—one first prize, one supplementary prize, one third, and two fourth prizes, and one ticket of honourable mention. MM. Gregorie and Son, of Almenéches, Orne, topped the class for heifers between two and three years old, with a roan, thirty months old, very strong and fleshy. Neither style nor quality, however, was displayed by her. In the old bull class the same gentlemen were third with a strong animal, unsatisfactory in the outline, more like the Norman than the Shorthorn breed, and bare on the top, but soft and kindly under the hand. An honourable mention was also awarded to these gentlemen for a big plain five-year-old soft-handling roan cow. As a rule, these Norman crosses were big and pleasant to touch, though not true in form. M. Ancelin, of Chapelle-sous-Gerberoy, Oise, got the fourth prize in the

young bull class with a Norman cross, indicating great improvement on the original Norman race.

The *Shorthorn-Dutch* crosses were not quite so successful as one might have expected, looking to the similarity in the form of the two breeds. The Shorthorn influence has only effected slight improvement. Ten specimens were entered, but only one prize —a fifth—was theirs. That premium was awarded to M. Plaisant, of Beaurains-les-Arras, Pas-de-Calais, for a pepper-coloured heifer, thirty months old, of finer quality than the pure Dutch breed, but lacking style and symmetry. The other specimens were only fair.

Ten specimens of the *Shorthorn-Flemish* cross were entered, but several failed to appear. These crosses showed improvement on the pure Flemish breed in regard to weight and wealth of carcass, and also in respect of quality; but still it could hardly be said they were animals of a high class. They got only a fifth prize and two tickets of honourable mention. The former went to a red heifer, twenty months old, large in size, but bare of flesh, owned by M. Fétel-Longueval, of Loon, Nord.

Two *Shorthorn-Limousin* crosses were shown, but no official honour could be spared to them.

One cross between the Shorthorn and the *Femeline* was shown, but had to go home without any mark of distinction. A two-year-old *Shorthorn-Bourguignon* heifer, the property of M. Merle, of Chatol-Gerard, Yonne, was awarded an honourable mention. White-and-black in colour, she was all over a fair animal, massive, yet likely to make a good milker. M. Abafour, of Miré, Maine-et-Loire, obtained a well-deserved supplementary prize for a three-year-old *Shorthorn-Breton* roan cow. She was a useful stamp of an animal; there were, perhaps, not half-a-dozen better in the Section. She was short in the legs, thick, even, and splendidly covered with flesh of superior quality. From what we saw and learned of it we thought this cross preeminently successful. The Breton cattle are pretty little animals, and the infusion of Shorthorn blood increases the size wonderfully. A *Shorthorn-Lorraine* cow, exhibited by M. Lamy, had fair outline and size if she had only had more flesh. More success was exhibited in a *Shorthorn-Swiss* cow, shown by M. Broquet, of Void, Meuse. This animal displayed great improvement upon the pure Swiss cattle, and was in some respects a curiosity. It is evident that the two breeds would blend well together, and that the Swiss would be greatly benefited by the English infusion. In the Section were shown a good many animals whose breeding was not specified beyond that they were Shorthorn crosses. Some were good, others only fair.

Various Crosses.—In the Section for *Croisements Divers*, 47 animals were entered. The variety of colour, form, and general

characteristics presented was quite bewildering, close on 30 different crosses being represented. Many of the animals possessed plenty of size and substance, but only a few showed either superior form or good quality. Among these few were crosses between the Manceau and various races, the Swiss and the Shorthorn, the Ayrshire and the Shorthorn, the Nivernais and the Bourguignon, and different kinds of Dutch crosses. The Limousin-Garonnais cross seemed an excellent animal for work, but lacked quality, and was not very neat. The Swiss cross was indeed a very good animal, much more like the Shorthorn breed than the Swiss. The most satisfactory of all, however, were the Manceau crosses, which were shown by M. Cherbonneau.

Sheep.—British Breeds.

Southdown Breed.—Though not quite equal either in numbers or average merit to what is usually seen at the "Royal" Show, the display of this valuable mutton breed was nevertheless highly creditable to English breeders. Of this we have ample proof in the fact that the celebrated flocks of His Royal Highness the Prince of Wales and of Lord Walsingham were represented. No better material of the kind could be found anywhere than in these flocks, especially the Merton one. Here, as has often been the case, Lord Walsingham had the best of several smart contests, though His Royal Highness also won several coveted honours. From the flocks of Messrs. Emery, Messrs. Heasman, Mr. J. J. Colman, and Mr. Hugh Gorringe, there came sufficient material to make keen competition. In the young female class Mr. Gorringe scored a decided victory. In the class for tups under eighteen months old, Lord Walsingham was invincible, with a handsome fourteen-month tup, very good on the back, true in form, and well-covered with flesh, though he might have been a trifle neater about the head. He was got by the first-prize winner at the "Royal" at Birmingham, and out of a ewe by "Royal Manchester." Closely following came a fourteen-month tup, showing grand style, fine-turned quarters, and excellent front, owned by Mr. Hugh Gorringe, Kingston-by-Sea, Shoreham, Sussex. His quality and wool were very good, but he would have been better with a little more flesh along the back. Mr. J. J. Colman, M.P., of Carrow House, Norwich, ranked third with a short, thick, neat tup of the same age; the Messrs. Emery, of Hurston Place, Pulborough, Sussex, came fourth with a son of "Old Hurston," and out of "Battersea."

In the old tup class, Lord Walsingham again came to the front, the successful animal in this case being "Royal Birmingham," the sire of the first-prize young tup. First at Birmingham in the young class, and at Liverpool last year in the old class,

this animal needs no further comment here. He was still in grand form, and attracted many admirers, carrying, as he did, his mutton very evenly. Mr. Colman's second ram was a handsome two-year-old, specially good in front and well covered with mutton and wool. The Messrs. Emery were third, with a tup of similar breeding to their fourth-prize youngster; while the Prince of Wales came in fourth with a tidy twenty-seven-month tup, showing good style and breeding.

The contest in the class for females under eighteen months old was exceptionally keen, and yet Mr. Gorringe was clearly entitled to the highest position with his stylish, well-brought-out, well-bred pen. They had smart, lively heads, attractive symmetry, and excellent quality. The second-prize pen, owned by the Prince of Wales, were lengthy well-covered sheep, showing good breeding and fine quality. Two were specially good; the other lacked character a little. A well-matched pen shown by Mr. Colman stood third, Lord Walsingham having to be contented with a fourth prize, as he had reserved his best pen for the Bristol "Royal," where they were unbeaten. In the ewe class, however, his Lordship pulled up into his wonted position, coming first with an excellent pen, two of which were got by "Royal Manchester," and the other by "Perfection." Two of them were very fine ewes, splendidly covered all over, but the third was rather weak on the loins. Messrs. Emery came second, with a pen got by "Old Hurston," Mr. Gorringe third, and the Prince of Wales fourth.

With such success in the Section, Lord Walsingham was early expected to have a strong chance of carrying off the 1500-franc prize (60*l.*), for the best group of mutton-producing sheep of any breed not French, in the Exhibition; an honour which, in due time, fell to his Lordship's credit. Stiff as sales were, as a rule, at the Exhibition, the demand for Southdown sheep was brisk, and nearly all the English specimens which were offered found ready purchasers in French flock-owners. Mr. Gorringe sold a tup to Count de Bouillé, of Villars, Nièvre, a prominent breeder of Southdowns in France. The whole of Lord Walsingham's group was sold to M. Nouette-Delorme, Loiret, who exhibited in the French Division a lot of good specimens of the Southdown breed. He also showed a tup among the English animals, beside which it lacked finish somewhat.

Oxford Downs.—Originally, Shropshires, Oxford Downs, Hampshire Downs, and similar breeds were grouped together in the premium list; but before the judging took place each breed was arranged by itself, and awarded prizes. Of the Oxfordshire Downs there were thirty-three entries from England, and four or five from Belgium. Mr. J. Treadwell, Upper Winchenden, Aylesbury; Mr. Chas. Howard, Biddenham, Bedford; Mr. G.

Street, Maulden, Ampthill, Bedfordshire; and Mr. F. Street, St. Ives, Huntingdonshire, divided the prizes pretty equally, Mr. Howard having rather the largest share. He came first in the two female classes with large and very handsome sheep, well-clad with both wool and mutton; while in each of the two male classes he was second. Mr. Treadwell was first in the young tup class, and second both among old tups and ewes. His sheep handled admirably, and they were broad and even in form. The old tup class was headed by a very fine twenty-seven-month sheep, owned by Mr. G. Street, and descended from the stocks of Messrs. Howard, Druce, and Roberts. The mere mention of the flocks represented is sufficient to convince every Englishman that this early maturing and very valuable mutton-producing breed made a good appearance on French soil.

M. Tiberghien, Manage, Hainault, in whose name the Belgian sheep were entered, demonstrated his desire to improve his flock by securing at a good price one of Mr. Howard's tups.

Hampshire Downs.—Four good specimens of this breed were shown by Mr. Robert Russell, Horton Court Lodge, Dartford, Kent. They had no opposition, however, and two special prizes were deservedly awarded to them.

Dorsets.—Of this hardy breed eight very fine sheep were shown by M. G. W. Homer, Athelhampton Hall, Dorchester. They, too, were alone in their glory, which was to be regretted, for they would have held their own against very strong opponents. They were reared from stock which has been in Mr. Homer's possession for a long time; and were large in size, symmetrical in form, broad on the back, long in the quarters, and carried a heavy load of mutton, evenly laid on. They were awarded two special prizes and one ticket of "very honourable mention." They formed the strongest opponents to Lord Walsingham's successful group of Southdowns for the 1500-franc mutton prize, and we understand that among the Jurors there was division of opinion as to which of the two groups best deserved the coveted trophy. It is said of the Dorsets that "the body is tall and light, and the legs are long." Mr. Homer's sheep were certainly tall, but their bodies were very thick and heavy, and their legs of moderate length.

Leicesters.—In the Foreign Division there were twenty-nine entries of this justly popular breed, twenty-one of which were from England, four from France, and four from Belgium. The foreign sheep were nothing more than fair specimens of the breed; and, with one exception, all the premiums came to English animals. The contest lay chiefly between Mr. George Turner, junior, Thorpelands, Northampton, and Mr. R. W. Creswell, of Ravenstone, Ashby-de-la-Zouch. Mr. Turner showed a very fine lot of sheep,—compact, thick, well-matured, splendidly

covered, and of very fine quality. He was first in three of the classes and second in the other. Mr. Creswell, whose sheep handled exceeding well, and showed good frames, was second in the two young classes and first in the old tup class, the winner of the latter prize being a very excellent specimen of the English Leicester. The second prize in the ewe class went to a very good pen belonging to M. Noblet, of Chateau-Renard, Loiret. Mr. Turner's first-prize pen of ewes were first at the Bath and West of England Show last year, and third at the "Royal" at Liverpool; while his first-prize two-shear tup was second in the young class at the latter exhibition.

Lincolns.—This useful long-woolled breed was very creditably represented. Twenty-five pens were entered, and in point of merit the display was exceptionally strong. Mr. John Pears, Mere, Lincoln; Mr. R. C. Catling, Needham Hall, Wisbeach, Cambridgeshire; and Messrs. Dudding, Panton House, Wragby, Lincolnshire, had a very close and exciting contest for the honours,—Mr. Pears carrying off rather the largest share. His sheep, bred by himself, and descended from strains which have been in the flock for nearly half a century, were large, well woolled, evenly covered, and showed that, from a butcher's point of view in particular, this breed has been substantially improved during recent years. He was first in the young tup class, first for ewes, and second in each of the other two classes. Mr. Catling, whose sheep were also well bred, large, and well-woolled, topped the young female class, and also the old tup class. The gimmers were especially good, and were got by "Volunteer," a distinguished sire. The Messrs. Dudding had two second prizes and one ticket of honourable mention. Their flock is old and well established, and the appearance it made on this occasion was worthy of its reputation. Like those of Mr. Catling, the Messrs. Dudding's young sheep claimed descent from the stock of Mr. Kirkham.

Kentish.—Of this very hardy variety of the fleecy tribe there was only one exhibitor, Mr. R. Russell, Horton Court Lodge, Dartford, Kent. Both they and the Lincolns were originally grouped with Leicesters; but it was found that such mixing up could but result in dissatisfaction, and the breeds were separated accordingly. Though Mr. Russell had no opposition, he was deservedly awarded a special prize, which was adjudged to a handsome tup, fourteen months old. All his animals were of the improved Kentish breed.

Cotswolds.—Probably none of the English breeds were better represented than this one. Mr. Russell Swanwick, of the Agricultural College, Cirencester, had the field entirely to himself; but better specimens of the breed than those exhibited by

him could not possibly have been found. Of great size, they were well brought out and full of character. Both mutton and wool were plentiful in these lots. They were descended mainly from the stocks of Mr. William Lane, Broadfield, Gloucestershire, and Mr. Garne, Aldsworth, Gloucestershire. Four special prizes were awarded to them.

Cheviots.—Mr. John Robson, Birness, Otterburn, Northumberland, was the only exhibitor of these hardy, active, Border mountain sheep. He entered ten, all very good sheep, well-bred, nicely furnished animals, well-covered with flesh of fine quality.

Black-faces. — Of this profitable Scotch breed there were twelve entries, the only exhibitors being Mr. J. Duncan of Benmore, Kilmun, Argyleshire; and Mr. W. Beattie, Crocknacunnie, Ireland. The premiums were equally divided between the two, Mr. Duncan being first and Mr. Beattie second among the tups, while the order was reversed in the female class. In each of the two lots there were some really good specimens. Mr. Duncan's first-prize tup, two years old, handsome in body, and excellent on the top, was bred by Mr. Aiken, Listonshiels, and was third in his class at the "Highland" Show at Edinburgh last year. Mr. Beattie's sheep were descended mainly from the Overshiels stock, and were well-bred, large in size, and of good quality. The demand for Black-faced sheep was active, and Mr. Beattie disposed of his lot to Frenchmen at high prices. One yearling tup and three gimmers were secured for a Zoological Garden in the West of France.

French Sheep.

Merino Breed.—Justice will be done to French Sheep-husbandry by another pen. We need therefore say very little on the subject here. The importance which attaches to the Merino breed will best be understood when it is mentioned that, in a pure state or nearly so, it is represented in round numbers by about 9,000,000 animals; and that, with all the crosses which possess less or more Merino blood, it makes nearly two-thirds of the whole stock of sheep in France, which in 1873 numbered close on 26,000,000. This woolly tribe, which, having been brought from Africa to Spain, spread from the latter country not only over a vast extent of the continent of Europe, but also Westwards into the broad prairies and wide mountain ranges of America, was introduced into France in 1786. In that year Louis XVI. obtained permission from the King of Spain to select and import 364 specimens of the breed; and with these he established a Government or National *bergerie* or flock at his property of

Rambouillet, in the Department of Seine-et-Oise. In 1800 another importation was made; and during the many years that have since elapsed, the flock thus founded has been managed with a perseverance and intelligence that reflect the highest credit on the country. The Rambouillet flock, indeed, has acquired qualities so widely different, not only from the stock from which it sprung but also from the general body of Merinos as they appear over the country at the present day, that it has come to be regarded as a distinct branch of the breed bearing the name of Rambouillet. The Merinos in Austria, and the surrounding region of the Continent are called Negretti-Merinos; and in Germany Electoral-Merinos, the title in the latter case having been assigned from the circumstance that in 1765 the Elector of Saxony introduced the breed into Germany from Spain.

Though differing in a slight degree, neither of these two varieties has such distinctive characteristics as the Rambouillet stock of France. In his admirable report on "The Agricultural Features of the Vienna Exhibition" (published in part i., vol. x., second series of this Journal), Professor Wrightson dealt specially with the characteristics of the Merino breed. It will therefore suffice here to state in a few words that originally the Merino sheep were unequalled for their yield and quality of wool, but were very inferior in the production of mutton. The Government officials who had charge of the Rambouillet flock, desirous of obtaining a double revenue from the breed, turned their attention at an early period to the improving of the size and symmetry of the frame, and the increasing of the weight of the fleece, which before had been noted more for its quality than its weight. They kept the breed pure, but so carefully and systematically did they carry out the process of selection, that in both respects their efforts were eminently successful. The originally high quality of the wool was modified slightly, but this was more than compensated for by the increase in the weight of the fleece and in the strength and length of the staple. Early maturity and capacity to take on flesh were next cultivated, and that too with almost equal success. The stock that have been reared during recent years at Rambouillet are, we believe, as different from the animals that were stationed there in 1786 as it is possible to conceive. The breed has been transformed in outline and characteristics. The Rambouillet flock has earned a world-wide reputation; and between 1797 and 1872, no less than 3,472,343 francs (about 138,893*l.*) were received from the sale of its wool and surplus stock. During that period 4309 rams, 3581 ewes, and 3025 mutton-sheep, and 131,165 kilogrammes (about 130 tons) of wool, were sold from this establishment.

The great majority of the breeding-sheep, of course, were secured by Frenchmen and other breeders on the Continent of Europe; but a good many went both to Australia and America. National breeding establishments have been formed and carried on successfully at other centres; and the favourable influence which the movement has exercised on the rural industry of France can hardly be overestimated. From the preliminary notice referring to Merino Sheep in the Catalogue of the Exhibition, we quote the following:—

"The Merinos are widely scattered over France; and their introduction has caused quite a revolution in its agriculture. It has been the point of departure of numerous and important improvements, among which we may cite in the first instance the extension given to the cultivation of artificial meadows. A great part of the native French flocks have been completely transformed by the continued employment of Merino tups, the result of this absorption of the indigenous races by the Merinos being that the absorbed races are now known as Metis-Merinos [or half-bred Merinos]. The most celebrated of the French Merinos are those of Soissonnais, of Chatellonnais, of the Beauce, and of Champagne. To the *bergeries* in these different districts, as to the experimental *bergerie* of Rambouillet, where the Merino race has remained perfectly pure, foreign breeders come every year and buy breeding animals at the highest prices. During the last fifteen years the race has undergone some happy changes. In consequence of the decrease in the price of wool and the increase in the demand for mutton, the fleece of the Merino, as well as its conformation and aptitude to fatten, have been singularly changed. Thus we have to-day in France Merinos carrying sufficient wool—fine, long, soft, and strong—and furnishing, at an advanced age, mutton of much finer quality than formerly."

The muster of Merinos, which were naturally awarded the premier position in the Catalogue, was one of the most attractive features of the Exhibition. Pure-bred and *metis* or half-bred Merinos were joined in competition; and together they formed a display which has perhaps never been excelled, if indeed equalled by any other variety of the fleecy tribe. No fewer than 279 entries were made, and in each of the female pens there were three animals. The question as to the desirability of further improvement in the breed may be referred to afterwards. In the meantime it is gratifying to be able to say that the turn-out of Merinos was as remarkable in point of merit as in regard to numbers; indeed, the improvement displayed, particularly in the size and symmetry of the body and in the cover of flesh, was quite wonderful. In America, where in many cases no attempt has as yet been made to develop the meat-producing properties of the breed—the ancient fine-woolled variety being still quite common—we have examined many large flocks of so-called pure-bred Merinos. Between these, however, and the French ones exhibited at Paris there was as much difference as between a third-rate specimen of the Black-

faced breed and a thoroughly good Cotswold. Instead of the light, uneven bodied, coarse-boned, bare-fleshed Merino of old, there were at Paris Merinos handsome in frame, large in size, moderately fine in bone, and carrying a heavy, well-laid-on coat of flesh. Indeed, it is as evident as anything can be that in the better flocks of France the value of the Merino has been increased twofold by the improvement which it has undergone since its introduction into that country. That improvement has been brought about in the main, as already noticed, by careful selection in breeding and by better treatment of the flocks, but still in many cases infusion of strange blood has had something to do with it. It is significant that while pure-bred and half-bred Merinos were nearly equal in number, thirty-two premiums and commendation tickets were awarded to the former and only seventeen to the latter. The apportionment of the honours will be better understood when it is mentioned that in the four male classes two first, two second, two third, three fourth, and one fifth prizes, and three tickets of honourable mention were awarded to pure-bred Merinos: and two first, one second, and two third prizes to *Metis*-Merinos. In the four female classes the pure-breds secured four first, three second, three third, three fourth, two fifth, one sixth, and one seventh prize, and two tickets of honourable mention; while the *Metis*-Merinos had to be content with one second, one third, one fourth, two fifth, two sixth, one seventh, and two eighth prizes, and two tickets of honourable mention. It would thus appear that in the eyes of the Jury the improvement effected by selection had been the most successful. The breed was originally entered in four classes, without any distinction as to characteristics; but in the awarding of the honours each of these four classes was divided into two, abundance and fineness of wool being the important or ruling points in the one, and development and conformation of the body in the other. It is interesting and important to note that the half-bred Merinos were more successful in the wool-classes than in what may be called the mutton-classes. Indeed, as will be seen, only two or three of the higher premiums in the "development and conformation" classes fell to their lot. The inference which might thus be drawn from the awards is that the Merinos are less likely to be satisfactorily improved in the respect in which they most need improvement, namely, their mutton-producing properties, by the infusion of blood from any of the French breeds than by careful selection within their own ranks, together with liberal feeding. With that inference our opinion fully coincides, for we do not think that any of the French breeds could be expected to produce such improvement as is required by the Merinos. Indeed, the French races themselves

stand in need of improvement in "development and conformation," which have always been regarded as the weak points of the Merino breed.

From the National Bergerie at Rambouillet a few specimens of what may be called the pure improved Merinos, which have rendered Rambouillet famous all over the country, were forwarded for exhibition only. They were about equal in size, but bigger in the bone and rougher in the shapes than the average of the *Metis*-Merinos. Specimens were also shown of the Mauchamp and the Merino-Mauchamp sheep. The Mauchamp sub-race is Merino-cross, started by M. Graux about fifty years ago. Its form is imperfect, but its wool is very fine.

Long-woolled French Sheep.—The second Section was filled by what are called the "Long-woolled Races of France." They occupy a large portion of the north-west of France, and though now divided into several varieties, they were originally descended from the Flemish breed. In the Nord they were called *Flamand;* in the Pas-de-Calais, *Artoisien;* in the Somme, *Picard;* in Seine-Inférieure, *Normand;* in the two Charentes, *Saintongeois;* and in La Vendée, *Vendéen.* The difference between the several varieties is slight, and all still retain the leading characteristics of the original Flemish race. They stand high on the leg, are not very fascinating in form; and their wool is long and coarse. It is stated that their principal merit is aptitude to fatten; but a stranger would not place them very high as meat-producing sheep. During the past thirty years they have been greatly improved, in some cases by selection in breeding, and in others by the infusion of Leicester (Dishley) or Improved Kentish blood. The Leicester cross was invariably most successful. The principal prizes went to the Norman variety, the most successful exhibitor of these being M. Lasnou, Seine-Inférieure.

Common-woolled Races of the Plains.—Of these the principal varieties are the *Berrichon* and *Solognot.* The former are found chiefly in Indre, Cher, and part of Loir-et-Cher; and the latter in Loir-et-Cher. Similar in form and general appearance, these two races are described as being rustic, and easily fed up; while their flesh is said to be very savoury and much sought after. The wool, as a rule, is short, coarse, and dry; the head is curiously curved, with the nose pointing upwards and the ears hanging back. The thighs are very thin and bare of wool. The Solognot is distinguished by the reddish colour of its nose and legs. In the south of Chateauroux there is a variety of the Berrichon called the *Berrichon-Crevant*, which enjoys a good reputation for its fattening properties. These races have also been very substantially improved by crossing with other breeds, particularly with the Southdowns and Leicesters of England. The

French Charmoise race—a cross between the Berrichon and New or Improved Kentish of England—has also been used with good results in crossing with these breeds. The latter cross, less violent than that of the Southdown or Leicester, because of its affinity to the Berrichon, has become very popular with some flock-owners. The Section contained some twenty entries, and among the lot were some very fair sheep, In the tup class a thirteen-month-old Solognot, firm on the back, brown in the face, and in general appearance a little like the English Southdown, came first; while the second and third prizes went to Berrichon tups, one of which had a short thick head, fair body, good rib, but short quarters. The other was neat, but rather light round the waist. The Solognot variety again came to the front in the female class, the winning pen in each case belonging to M. Lefebvre-Laforge, Saint-Florent, Loiret. The females were even little animals, brown in the face and of fair quality. The second prize here went to a Crevant pen, also small in size and presenting some likeness to English Leicesters. The other varieties in the Section were of inferior merit.

French Mountain Sheep.—These breeds seem to be numerous, but hardly any of the specimens of them exhibited were above mediocrity. The Section contained fifty entries, which represented about a dozen different races or sub-races. The Larzac, of which six were shown, is found principally in Aveyron. The animals are small, and narrow in the chest; the wool is coarse and strong, but the flesh is said to be of nice quality. The breed is famous for its milking properties, and its milk is largely used in the manufacture of the celebrated Roquefort cheese. The Lauragnais, originally belonging to the neighbourhood of Castelnaudary, has spread into Haute-Garonne, Aude, Gers, Tarn-et-Garonne, Lot-et-Garonne, and Ariége. Like the Larzac race, it is hornless, the head is moderately fine, the body large, the chest deep, quarters long, and wool coarse and thick. It is very prolific, and its milk is also used in the manufacture of cheese. The second prize in the male class fell to a specimen of this tribe, owned by M. Bajol, Aude. This tup, only thirteen months old, was large and symmetrical, and resembled the Cheviot breed about the head and face. The first prize was awarded to a specimen of the *Barbarin* race, shown by M. Tempier, Gard. Brown in the legs, partly brown in the face, this animal had long hanging ears of the same colour, a long narrow frame, bare of flesh, but well-covered with wool of fine texture. The legs were rather long and coarse, and on the tail there was a strange development measuring about eight inches in breadth. A pen of the same race and ownership was also first among the females. These were large, and good on the

loins, but rather defective in quality. The second prize in the female class went to a pen of the Mézenc race, and the third to sheep of the Ariégeois breed, which in some respects resembled Cheviots. Three specimens of the sheep of the Alps were shown, but could not have earned a very high reputation. They were bare, thin creatures. Among this small flock there were four black sheep!—specimens of the Chilloe breed, shown from the Haute-Loire. They were not very good—nor could we see much about the other varieties to recommend them.

Charmoise.—As already stated, the origin of this race was a cross between the New Kentish and the Berrichon breeds. It was established about thirty-eight years ago by a celebrated French breeder, M. Malingié-Nouel, at the farm of Charmoise, in Loire-et-Cher; and has attained wonderful uniformity in shape and characteristics. The animals are "near the ground, short and thick." The head is small, the eyes are keen and dark, the body is broad and compact, and well-covered with mutton. These sheep fatten much more quickly than most of the other French breeds, the bone is fine and the amount of offal very small. They need, however, some improvement, more particularly an increase in size. A cross with the Border-Leicester or the Cotswold breed should give satisfactory results. The Charmoise race has been freely crossed with the Berrichon and Solognot breeds, and it is stated that it has contributed in a notable degree to their improvement. About forty of the breed were entered.

Leicesters (Dishley).—The main object for which English breeds have been imported into France was the crossing with and thus improving the native sorts. Both of Leicesters and South-downs, however, several pure-bred flocks are maintained in the country. French breeders affirm that the Leicester in its pure state is too soft for France; that it can neither withstand cold nor endure much walking; but they readily admit that it has rendered and is still rendering valuable services in the improving of the native breeds. On this latter point more hereafter. More than eighty pure-bred Leicesters were exhibited in the French Division, the principal exhibits coming from the departments of Nièvre, Manche, Maine-et-Loire, Cher, Loiret, and Aisne. A few would have made a creditable appearance in an English Showyard; but, on the other hand, a good many showed a slight want both of quality and true Leicester character, as well as rather big bones and lack of finish. M. Tiersonnier, Gimouille, Nièvre, who owns a well-bred and very valuable flock of Leicesters, was first in both classes, his first-prize tup being a beautiful sheep of three summers. Large, broad, deep, and level, he was well-sprung in the rib, full in front, and good below, but a little uneven behind. His wool was of beautiful

texture. The first-prize pen in the female class was composed of three good thirteen-month-old sheep, with fine bone and capital wool. One had a magnificent top; another was a very tidy little sheep, a trifle light on the quarters and thighs, but wide and deep in the rib; and the third was a little deficient in the quarters, but of superior quality. A Manche breeder, M. Millard, followed M. Tiersonnier in both classes. His second-prize tup, three years old, was uniformly grown, well-covered with flesh, a trifle short in the body, fine in the wool, and excellent on the rib and bosom. His second-prize pen in the female class, three two-year-old ewes, showed style and quality. They had immense fore-rib and shoulder, and a good coating of flesh, but deficient quarters. The third prize in the tup class went to a very heavy, thick, fine-woolled tup, splendidly covered, and owned by M. Abafour, Maine-et-Loire. A neat little shearling, well-sprung in the rib, good over the shoulder, narrow in the quarters, of fine quality, and fine long curly wool, exhibited by M. Massé, Cher, was very highly commended; while a similar honour was conferred on a good fourteen-month tup, not very fine in the bone, shown by M. Noblet, of Château-Renard, Loiret. A supplementary prize was deservedly awarded to a very good tup shown by M. Gillain, of Carentan, Manche. Our note-book says that another tup had excellent top, but coarse bone; another, short and thick; another, bare below and flat on the rib, and lacking character. M. Gillain was third in the female class with a pen of fine-woolled but slightly strong-boned ewes. Several of the other pens in the female class handled well, but were rather big in the bone. As a rule, the animals were in good showing condition.

Southdowns.—This breed may almost be said to have had the Section for foreign (not French) Short-woolled sheep to itself, as was the case with the Leicester in the corresponding Long-woolled classes. In this Short-woolled Section, however, there were four classes, and about 175*l.* of prize money, as against two classes, and 87*l.* for Long-woolled foreigners—a preference which must be set down to the popularity of the Southdown in France. Of the fifty entries, the majority came from the departments of Nièvre, Loiret, Vienne, and Mayenne. The principal exhibitor was M. Nouette-Delorme, of Ouzouer-des-Champs, Loiret, whose flock of Southdowns is one of the largest as well as one of the best in France, and who, as already stated, purchased Lord Walsingham's fine group of Southdowns. The honours, however, were equally divided between him and Count de Bouillé, of Villars, Nièvre, whose name is perhaps better known than that of any other gentleman in France in connection with the rearing of Southdowns. The Count came to England to make himself acquainted with the breeding of

Southdowns, and had the benefit of advice from that distinguished breeder and judge, Jonas Webb. In 1855 he founded a flock with fifteen ewes in-lamb, each of which cost 16*l.*, and two years later he made a further importation of one ram and fifty-five ewes. He is said to have personally superintended the management of his valuable flock, and it is pleasing to note that his success has been most gratifying. The sheep he exhibited on this occasion were indeed thoroughly good specimens, such as any English breeder might be proud to exhibit. His first-prize young tup was a little light round the waist, but very good on the loins and quarters. His first-prize pen of gimmers were neat, finer in the bone than most of the others, and showed more character and better quality even than his tups. The second-prize aged tup, also shown by Count de Bouillé, had fair style, good form and excellent quarters, but was a trifle long in the legs, and slightly rough about the head. He was again second in the ewe class with large fleshy sheep, coming wonderfully up to the true Southdown character. M. Nouette-Delorme's sheep, as a rule, showed, if anything, a better quality than those of the Count de Bouillé, but, all over, the advantage either way was insignificant. M. Nouette-Delorme's first-prize aged tup was a heavy sheep, twenty-five months old, very good on the thighs, and grand in the neck. His first-prize ewes were not well matched. In the young tup class he came second with a thirteen-month ram, of satisfactory size, good top, well-sprung rib, and rich cover of flesh, but somewhat lacking in style. He occupied a similar position in the young female class, with a pen of small but very uniform sheep, with fine bone. Several tickets of very honourable and honourable mention were also awarded to the Count de Bouillé and M. Nouette-Delorme, between whom the contest was warm and interesting. The third prize in the old tup class went to a short thick sheep, good on the loins, but bare on the shoulder, owned by M. de Villepin, of Jupilles, Sarthe; while the corresponding premium in the ewe class fell to a very fair pen shown by Baron de Saint-Priest, of Parage, Tarn-et-Garonne. In each of the two young classes M. Boulay, of Jonvelle, Haute-Saône, came third with sheep of the Swiss breed. It is evident that the Southdown takes kindly to the climate of France; and on the whole the breed was well represented in the French Division of the Exhibition. Special prizes of objects of art were awarded to the Count de Bouillé and M. Nouette-Delorme, for their groups of Southdowns. M. E. Teisserenc de Bort, jun., of Saint-Priest-Taurion, Haute-Vienne, had forwarded, for exhibition only, a few very good sheep of the Southdown breed.

Cross-Bred Sheep.—Much as the Merino breed has been

ameliorated since its introduction into France, there is still room for further improvement, more particularly in its mutton-producing properties. It is also clear that the influence necessary to produce that improvement does not exist in any of the native races. Indeed, as a rule, French sheep are poor mutton-producers. Of the meat eaten in France, only about 13 per cent. consists of mutton, and yet, small as the consumption is, it is greatly in excess of the home supply. The yearly importations exceed the exportations by over 1,000,000 head, and the balance of the money-cost is stated by Mr. Richardson to exceed 2,000,000*l.* Great Britain has taken the lead of all countries in the production of mutton, as well as in the raising of beef; and therefore it is natural that France should have come to England to seek the influence by which the desired improvement in its sheep might be effected. The New Kentish breed was tried, but did not succeed; and, as far as British breeds are concerned, the Leicester and Southdown breeds have now the field almost wholly to themselves. They have both been used extensively for many years; and, despite a prejudice against them in some districts, they are fast spreading over the country. As already hinted, these two important English breeds succeed fairly in France in their pure state; but it is evident that their proper mission in that country is the amelioration of the native and acclimatized races. It has also been demonstrated that they are eminently qualified for that purpose, and that already they have done much good work. Ever since the commencement of this crossing, a hot controversy has been going on in France among the votaries of the two races, as to which is best fitted for mating with the French breeds. We might turn Irish and reply, "Both are best!" In dry exposed parts, where pasture is bare or short, and therefore a good deal of walking necessary, the Southdown deserves the preference; but, on the other hand, where there is fair shelter and good pasture, the Leicester-cross should prove the more profitable. From the result of the Government sale at Grignon, in May 1877, it would seem that in that neighbourhood, at any rate, the Leicesters were most in favour. The Leicester tups averaged 28*l.* each, one bringing 44*l.*; 11 of the Leicester-Merino cross averaged 31*l.*, one reaching 66*l.*; 5 Shropshires brought an average of 17*l.* 10*s.*; and 12 Southdowns 13*l.* each. The arguments against "microscopic cutlets," and in favour of heavy early maturing sheep, are met by such doubtful assertions as that it costs "less to grow 110 lbs. of mutton with two sheep than with one, and that one pound of mutton from a two-year-old sheep costs less than from a sheep only one year old." There are no doubt some parts of France in which shelter and pasture are too scanty for a soft, heavy,

rapidly maturing breed of sheep; but even in those parts both the weight and precocity of the sheep might be greatly increased, with equal advantage to the breeders and to the nation at large. French sheep management, as a rule, is not satisfactory; and of course the introduction of a finer class of sheep, in place of the rough rustic races that at present occupy a great part of the country, would necessitate the adoption of more careful and more liberal treatment.

In the Cross Section there were in all 78 entries, representing sixteen different varieties of crosses. Whatever may be the case throughout France generally, as between the Leicester-Merino and the Southdown-Merino cross, the advantage in this display clearly enough lay with the former. About 60 specimens of the Leicester-Merino cross were exhibited, and of the 1500 francs offered in the Section as prize-money, 1400 francs fell to their lot. Speaking generally, these crosses showed a decided improvement on the pure-bred Merinos in regard to outline, depth of body, size of bone, and wealth of flesh. The majority, too, exhibited good quality and fair wool; but, on the other hand, several were big in the bone and of rather indifferent quality. In a few the Merino features predominated, and in these there was, as a rule, a want of quality and a bareness of flesh. All over the lot, however, the improvement from the original Merino, in a butcher's sense, was so manifest, that the cross must be pronounced a decided success. M. Martine-Lenglet, of Aubigny, Aisne, showed a few very fine sheep of the Leicester-Merino cross, and was first in the one class and second in the other. His first-prize ewes were well-formed, of good quality, and richly covered with flesh; while his second-prize tup was a thoroughly good mutton-sheep. M. Wallet, of Gannes, Oise, headed the tup class with a three-year-old Leicester-Merino of exceptionally fine quality, broad and deep, and carrying a heavy load of mutton; while the fourth prize in the female class fell to the same cross. The second prize in the female class was awarded to a pen of wealthy, well-topped two-year-old Leicester-Merino ewes, shown by M. Gouache-Baret, of Ollé, Eure-et-Loire. Of a commended tup of this cross, our note-book says: "light on the shoulder and neck, but good on the back, and well-sprung in the rib;" of another, honoured with no official recognition, "would pass for a fair pure-bred Leicester tup, good under the hand, well-furnished below, and wool of fine quality;" of another, "big in bone and lacking in quality, more of the Merino than the Leicester;" of another, "good mutton-sheep, great improvement upon the Merino, and full of quality;" and of another, "coarse wool, broad on the top, but rather long and strong in the legs." The superiority of the display of this cross

is proved by the fact that the 1500-franc (60*l.*) prize offered for the best group of French sheep, excluding Merinos and Metis-Merinos, was won by a Leicester-Merino group, the property of M. Wallet.

Only 8 animals of the Southdown-Merino cross were entered. Some of them, however, should have got a little further into the prize-list. No ticket of any kind could be spared to them, though "supplementary prizes" and "honourable mentions" were doled out to inferior animals with a liberality quite characteristic of the Exhibition. Two tups of this cross were shown. The one was well clad with mutton of good quality, and was of fair size, but not very even in form; the other, undersized, was deficient on the thighs, but good on the rib and fine in the bone. Two pens of Southdown-Merino ewes showed good quality, but wanted size and substance. Of the Southdown-Berrichon cross, one thick clumsy-looking tup was exhibited. Southdown-Cauchois ewes got a supplementary prize, and were fair-sized well-formed sheep, but somewhat bare of wool.

Of the Leicester-Berrichon cross there were several pens, two supplementary prizes being awarded to tups of this cross. They were fairly sized, with good ribs and quarters, but deficient fore-parts. The females were fine in the bone and of good quality, but rather light in the body and long in the legs. A tup of the Leicester-Cauchois cross got the fourth prize, but he was big in the bone and long in the legs. A few crosses between the Leicester and the Norman breed showed a great improvement on the pure Norman, especially in wealth of flesh; while the specimens of the Leicester-Artésien were very much finer in quality than those of the pure Artésien race. Among the other crosses there was nothing particularily noticeable.

Other Foreign Breeds.—Austria was represented in the Sheep Department by two or three specimens of the Merino breed, and two of the Zakkel breed. The former were shown by Count Hungadi-Emerie, Urmeney, Hungary, and were pretty good sheep. The latter were exhibited by Baron Romasynan, Galicia, and were long, coarse-woolled, and not very handsome in form. From Holland several pens of the Texel breed were exhibited; while Belgium contributed a few sheep of different breeds. In the Merino Section in the Foreign Division, Italy entered some nineteen animals, fair in point of merit, but not equal to the French Merinos.

Swine.—British Breeds.

The mention of the names of Messrs. Duckering, Messrs. Howard, Mr. Sexton, and Mr. Swanwick, as among the British

exhibitors of swine is sufficient guarantee that the piggeries of England were thoroughly well represented. The entries of English breeds numbered over 100, and, though heavier and fatter pigs than any shown here are generally seen at the "Royal" Show, the Paris display was nevertheless worthy of England's fame in this line of rural industry. Originally there were only two Sections, one for large and another for small breeds; but before the prizes were awarded, each Section was arranged into a division for black and one for white pigs. As might have been expected, however, the grouping together of different breeds did not give satisfaction. In the Large-breed Section, the Berkshire was the most extensively represented, there being of it no fewer than forty-five entries. They were alone in the black classes in the Large Section; and between Mr. C. E. Duckering, Whitehoe, Kirton Lindsey, Lincolnshire, Mr. Swanwick, Cirencester Agricultural College, and Mr. W. Hewer, Highworth, Wiltshire, the contest was very interesting. The former, however, took the lead in both classes with well-bred massive pigs. Mr. Swanwick came second for boars, and third for sows, with portly fine-boned pigs; while Mr. Hewer was second in the sow class, and fourth among boars. Mr. Stewart, Saint Bridge Farm, Gloucester, also showed some fine Berkshires, and got the third prize in the male, and fourth in the female classes. In the latter a "very honourable mention" was awarded to Mr. Humfrey, Shrivenham, Berkshire. The Messrs. Howard of Bedford, and the representatives of the late Mr. R. E Duckering, Northorpe, Kirton Lindsey, had the white classes in the Large-breed Section almost to themselves. They exhibited some excellent specimens, and divided the honours evenly.

In the Small-breed Section the contest was exceptionally keen, particularly in the white classes. The representatives of the late Mr. R. E. Duckering appeared here also, and with neat, plump, fleshy pigs obtained the highest premium in each of the classes, while Mr. C. E. Duckering secured a similar honour among black sows with symmetrical pigs of the Essex breed. Mr G. M. Sexton, Wherstead Hall, Ipswich, Suffolk, showed a lot of very superior Suffolk pigs; and, in addition to one first, two seconds, and a third prize in the classes, he was awarded "an object of art" in special recognition of the excellence of his group, which had a close run for the 1000-franc prize offered for the best group of pigs in the Exhibition. That honour fell to a French exhibitor, M. Poisson, but his winning group were of the English Middlesex breed. Her Majesty the Queen exhibited two good specimens of Prince Albert's Windsor breed, and got a third prize for the one, and an honourable mention for the other.

French Swine.

Since the beginning of the present century the stock of swine in France has increased by one-third, or from four to six million head. All over France pigs were formerly allowed to run about and pick up their food as best they could, in the fields and in the woods; but during the past thirty years a great deal more attention has been bestowed upon them. More care and selection have been evinced in breeding, and in some parts house-feeding has become quite general. English boars, principally of the Berkshire, New Leicester, and Yorkshire breeds, have for several years been used extensively with most satisfactory results, and, altogether, the raising of pork in France has assumed a very different magnitude from what it had half a century ago.

In the French Section there were over 250 swine, the large majority being either pure specimens of English breeds or crosses between English and French. The more important French breeds represented were the Norman, the Craonnais, the Bressan, the Lorraine, the Limousin, and the Bourbonnais. Of the two first mentioned, a few very good pigs were shown; but, with these exceptions, the display of French native pigs was not very fine. As a rule, they were ill-shaped animals, much too big in the bone, too narrow in the frame, and showed too much offal for the quantity of pork. Their heads were long and coarse, their legs long, strong, and rough; indeed, the remark of an expert in regard to one lot might have truly enough been applied to the large majority: "Cut off the rough parts and you have little left." It may be true, as is asserted, that these indigenous breeds have been greatly improved during the past thirty years; but they are still so inferior that we do not think any of them, without further amelioration, would remunerate liberal feeding, such as is extended to pigs in England. It was clearly demonstrated in the Cross-bred Section that these native swine produce very good stock when mated with English sires; and there is little doubt that the highly creditable appearance made by these crosses will result in the more extensive use of improved and imported sires. Specimens of crosses from the Berkshire, Yorkshire, Essex, Windsor, New Leicester, and Suffolk breeds were shown; the more successful being the Yorkshire-Norman, the Yorkshire-Craonnais, the Yorkshire-Picard, the Berkshire-Craonnais; and the New Leicester-Craonnais. A comparison between the pure French races and these crosses showed a wonderful improvement, particularly in regard to fineness of bone, breadth of frame, and wealth and quality of flesh in proportion to the size of bone and offal. The display of pure-bred English pigs by French breeders

was large and astonishingly good, the breeds represented being the Berkshire, Yorkshire, Middlesex, Essex, Windsor, and Suffolk. M. Poisson, Director of the Farm-school of Launoy, Cher, showed some beautiful specimens of the Middlesex breed, and won with them the first prize in each of the two classes; and also the 1000-franc prize for the best group of swine in the Exhibition, a success which reflects the highest credit on M. Poisson's skill and management. The second prizes in both classes went to pigs of the Yorkshire breed; and to a group of this sort owned by M. Noblet, of Château-Renard, Loiret, a special "prize of honour" was awarded. In the boar class, Berkshire pigs came seventh and eighth; while a Berkshire sow got third in her class. On the whole, the Yorkshire breed was rather better represented than its friendly rival the Berkshire. M. E. Teisserenc de Bort sent, for exhibition only, a few superb pigs of the Suffolk and Yorkshire breeds.

The Horse Show.

The Horse Show, which took place in the same enclosure as the display of cattle, sheep, and swine, opened on the 1st and closed on the 10th of September. The courts in which the cattle were exhibited were transformed into commodious and comfortable stables, each animal having to itself a loose box, enclosed partly by wood and partly by iron railing. The general arangements for the horse show were not so satisfactory as those for the other live-stock display. It was intended that, in the horse show, the contest in every class should partake of an international character, and thus horses from all nations were grouped together. There was no distinction of breed; all draught horses, for instance, of a certain height being shown in one class. In the majority of the classes three first, three second, and three third prizes were offered, and it was left to the discretion of the jurors to award one or all of these premiums to one nation. The result of this was, that in several of the classes the international character of the contest was let slip. The French jurors saw most merit in the French horses, the British jurors thought the British horses best, the Belgians could not get past their own breeds, and the warm international rivalry was cooled by an agreement to award one first, one second, and one third prize to each of these three nations. An arrangement was made whereby each nation's horses were stalled together, but all the many different breeds were mixed up in a confused condition; while, to make confusion worse confounded, the catalogue, except in a few cases, did not specify the breed. Another, and perhaps still more substantial cause for dissatisfaction, was the

reserving, as the particular patronage of the French jurors, the bestowal of the champion or group prizes to them. Despite these detracting influences, however, the horse show was a decided success. The entries, including 14 donkeys, numbered 1050, and the absentees were very few indeed. The following shows the entries from the various countries:

France (including 14 donkeys)	791
Belgium	91
Great Britain	66
Austria	56
Russia	26
Italy	10
Denmark	6
Holland	4
Total	1050

British Horses.

Light-Legged Horses.—England had no representation in the thoroughbred classes, but in the carriage and saddle, as well as in the draught section, English exhibitors made a very creditable appearance. Of the sixty-six British horses entered, twenty-seven were light-legged; and of these latter the Stand Stud Company, Manchester, had thirteen. The fine five-year-old mare "Rosalind," which beat the Duke of Hamilton's "Bird's Eye" at the "Royal" Show at Bristol, was, perhaps, the gem of the thirteen, good as were some of the others. She attracted many admirers; and though the Official Prize List gives the credit to a French mare, we believe she was really placed first in her class—that for saddle-mares four years old and upwards, and over 61 inches high. She is nearly pure-bred, and was got by the celebrated "Laughing Stock;" and along with "Speculation," another fine mare, six years old, was sold to a French officer, the price for the pair being 700 guineas. One of the three first prizes in the class for carriage-mares four years old and upwards, and over 64 inches high, fell to "Speculation," which was got by "Garibaldi," and which also elicited much admiration. The seven-year-old stallion "Little Wonder," by "Royal Oak," not unknown in English Showyards, had build and action worthy of the leading position which was assigned to him in his class. His merits were sufficiently attested by the fact that he was bought by the French Government for 300*l.* In the same class this Company were second with the four-year-old stallion "All Fours," got by "Tom Thumb." A second prize was also awarded to the six-year-old well-known mare "Expectation," by "Confidence," of the same ownership. "Star-of-the-East," also the property of this Company, showed grand action and

fine form, and got first in his class. Another of "Confidence's" get, "Bessie Brown," also familiar to the English Show-goer, secured a first ticket for Mr. Plate, Werneth Park, Lancashire. Her beautiful bone, clean muscle, and nice form, attracted the attention of foreigners. The celebrated Roadster Stallion "Young Fireaway," by "President," owned by Mr. Holmes, Scarborough, well merited the first honour awarded him. He showed excellent build and fine action, and has won many prizes in English Showyards; among last summer's winnings being the first at Manchester, the 50*l.* and Gold Medal at the Agricultural Hall, London, and the first at the Yorkshire Show. The only first prize in the class for pony stallions was not grudged to Mr. Christopher Wilson's strongly built, exceedingly active pony "Earl Derby," by "Perfection." Mr. Wilson's ponies are so well known in British Showyards, and have, indeed, so often been favourably noticed in the pages of this Journal, that a full description of their many grand points is unnecessary. The mere mention of Mr. Wilson's name as an exhibitor will satisfy many Englishmen that there was high merit in the class. The beautiful little four-year-old pony "George II.," owned and bred by Mr. Wilson, had barely his deserts in second honours. He was first at the last two "Royal" Shows, and has won many other prizes, while his sire, the distinguished "Sir George," was first at the "Royal" eight years in succession. "Sir George's" trotting powers, as displayed year after year in the Royal English Showyard ring, were invincible, and are, no doubt, in the recollection of many of the members of the Society. Lady Spencer Churchill's fine pony-mare "Matchless" deservedly won the only first in her class.

Draught Horses.—British draught horses to the number of thirty-nine were entered in eight different classes, viz., four for horses and mares over 16 hands, and a like number for those under that height. It must not be forgotten, however, that, as previously explained, these classes were open to animals from all countries.

In the class of entire horses over 16 hands and under four years, Mr. Wolton, Butley Abbey, might be proud of his first position; for although his colt "Royal Duke III.," out for the first time, is a heavy-bodied chestnut, partaking largely of the Suffolk type, he won against many good animals. Some British judges would have preferred Mr. Masters's second colt "Topsman," got by "Champion." He is a powerfully built, strong-legged, young horse, likely to make a useful sire. He will be remembered as the third winner at the Liverpool "Royal" in 1877, and second at the Bath and West of England Show the same year to the celebrated colt "British Wonder."

Mr. Stanford's (Ashurst) third-prize Bristol Clydesdale colt, the "Baronet," took a similar position here.

In the aged stallion class over 16 hands there was a very large competition, including many valuable animals of the Shire and Suffolk breeds. With such variety of type and character before the Judges, and so much really high merit, the decisions not unnaturally failed to accord with general public opinion. So close was the contest here, that the Jurors were glad to be relieved by the opportunity afforded them of giving a first, second, and third prize to each of the three leading countries competing, namely, England, France, and Belgium. The decisions were thus deprived of their international aspect. In the English section of the class Mr. Crowther's (Knowl Grove) "Carleton Tom," got by the well-known "Honest Tom," was selected for the highest premium. In English Shows he has won many honours, including the first at Manchester in 1876, and the second at the Birmingham "Royal" the same year. The Stand Stud Company's "Heart of Oak," also by "Honest Tom," looking his best, ran "Carleton Tom" closely. The Manchester horse was the first three-year-old at the Bedford "Royal" in 1874, and has since been in service in various parts of England, notably Gloucestershire. Mr. Garrett, Carleton Hall, got third for his handsome Suffolk stallion "Crown Prince," a frequent winner at county Shows. Mr. Wolton's first-prize Bristol Suffolk horse "Royalty" had to content himself with an honourable mention, as had also Mr. Crowther's "Compact Tom."

Additional evidence of the severity of the competition is supplied by the fact that Mr. Davis's powerful grey horse "General," the first-prize winner in his class at both the Taunton and Bristol "Royal" Shows, and Captain Betts's "Sir John Falstaff," were entirely passed over. In Great Britain there are very few entire horses of the draught stamp admissible in the class under 16 hands, the great majority being over that height. Mr. Toller, Gedgrave, barely got his deserts in second honours for his flat clean-boned colt "Robin Hood," the second winner at the Liverpool "Royal" last year; while the Stand Stud Company had to be content with a third ticket for "Ploughboy."

In the various female classes, nine English and eight Scotch mares appeared. The three-year-old class over 16 hands was headed by Mr. Capon's "Matchet II.," a beautiful Suffolk, from "Dennington." Characteristic of the breed, she displays heavy well-turned quarters, with an excellent top, strong body, and clean, active, though rather light legs; she was got by "Conqueror." The other two first prizes in this class were reserved, Mr. Drew's "Lucy" and "Barbara," from Merryton,

Hamilton, getting second and third respectively. The Merryton fillies have good legs and feet, and are fairly built, with good action. The former is a dark blue, likely to come out well as a mare; while "Barbara" is a useful-looking bay with good head and neck, and was third at Bristol.

Mr. Drew was in better form in the mare class over four years and 16 hands. Of the five first-prize tickets awarded in this large and excellent class, Mr. Drew had the honour of gaining the leading two. The Jurors appeared to have no hesitation in setting the beautiful bay mare "Countess," first at Bristol, and the handsome dark bay "Regina," readily aside for the premier tickets. "Countess" is all over a charming mare, possessing rare symmetry, nice flat bone, and true couplings. She girthed more than any other animal in the show, and is proportionate in build, and full of action. She lifts her legs gracefully, and carries them very neatly under her. She was only third, however, at the Dumfries Highland Show last summer, where "Regina" was fourth. "Countess" was bred in Derbyshire, from which county Mr. Drew selects some of his most successful prize takers. "Regina's" legs and feet are likely to wear well. The other three first tickets went to one Belgian and two French mares. Sixth in order of merit, with the first of the second tickets at her head, stood Mr. Drew's very compact, powerfully built, strong-limbed, roan, English-bred mare "Queen," which beat "Countess" and "Regina" at Dumfries. "Queen" is well feathered, and has a strong short back; but she has not the same showy appearance, and with an all-round sort of Jury was not likely to be so popular. The second of the third-prize tickets was awarded to Mr. Waddel's (Edinburgh) "Maggie," a very heavy, strongly put together, dark brown, with immense fore-arm, and great muscle. When the property of Mr. Meikle, Seafield, West Lothian, she was a winner in several Scotch shows. Her head is rather clumsy, but her neck, shoulders, and chest, are remarkably good; while she displayed heavier feather and more Clydesdale character, perhaps, than any other animal in the Show. Before a body of Clydesdale judges she would have stood higher.

The first of the four coveted tickets in the younger class under 16 hands, ultimately became the property of Mr. Drew's nice, out-coming, grey mare "Lovely," which has been a winner at local shows. The last of the four fell to Mr. Garrett's Shire mare "Scott." In the older class of mares under the 16 hands' limit there was a good collection. Special first prizes were awarded to Mr. Drew's "Myra," Mr. Stanford's "Poppet," and Mr. Wilson's (High Park) "Maggie."

In the competition for the 3000 francs offered for the best

collection of horses (won by M. Lefevre), both Mr. Drew and the Stand Stud Company made a good appearance. The latter had the larger number, and had, also, a greater variety represented by the seventeen, principally of the light-legged sort, which were drawn together, as it turned out, to no purpose. Of variety, Mr. Drew had not, of course, much; his lot of seven being all mares and three-year-old fillies of the heavier legged sort. The latter's mares made a stronger impression upon jurors and visitors, when drawn out to compete for the special prize for the best group of heavy draught horses. Ultimately they lost the prize, as elsewhere noticed; but, in the estimation of British visitors, the Merryton group had no rivals in the Show for heavy draught purposes. Mr. Drew had very great credit indeed in bringing out such a splendid lot of animals in such good trim; and though he had hard lines of it in the group contests, he fared well in the classes, getting for his seven animals four first tickets, two second, and a third. Some of them were bred by himself. The more successful of his prize animals, however, in recent years have been brought from England, where they were bred, and are understood to be crosses between Clydesdale stallions and Shire mares. The animals thus bred can hardly be termed Clydesdales; but call them what you may, there is no mistaking their high individual merit. In the selection of his horses Mr. Drew is exceptionally fastidious, not only as regards the form and build of the animals, but more especially in reference to the cleanness of leg, flatness of bone, and above all the size and soundness of the feet. It is noticeable that while the English "horsey" men apparently give preference to the form, size, and substantiality of the body, south-west of Scotland judges make the legs and feet the very first consideration, whether in purchasing or judging agricultural horses.

French Horses.

The stock of horses in France reaches, in round numbers, about 3,000,000. It is computed that of these about 1,800,000 are draught horses, 700,000 light, and 500,000 medium. The French army having proved such a heavy drain on the home stock of horses, the Government deemed it desirable to make special efforts, not only to maintain the strength of the chevaline ranks, but also to bring every animal within the command of the army. These steps have exercised a very important influence on horse-breeding in France, and therefore deserve brief notice here. In 1874 a decree was passed for the registration of all horses, the object being to render all suitable animals promptly available in case of war. The registration is

conducted by commissioners who visit every commune, and, in presence of the mayor, examine and classify all horses above six years old and not already in the public service. Horses have to be sent, sometimes more than fifteen miles, to the centres of examination, and, in case of failure to comply with this injunction, owners are liable to penalties varying from 2*l.* to 40*l.* A list of the horses examined, as well as a list of their owners' names and addresses, are deposited in the recruiting office for the district, a copy of each being left in the possession of the mayor. At these examinations the horses are classed as follows, viz.:—1st, those 15 hands 1 inch and over, for heavy cavalry; 2nd, from 14·3 to 15·1 for dragoons; 3rd, from 14·2 to 14·3 for hussars; 4th, heavy horses from 14·2 to 15·1 for artillery drivers; 5th, light horses of similar height, for the traces; 6th, heavy horses of 14·2 and under, for baggage waggons (only in this class entire horses are registered); and 7th, mules of 14·1 for various purposes. Of far greater importance are the Government breeding studs and dépôts. First established in 1666, discontinued during the Revolution, and re-established by Napoleon in 1806, these institutions have been in existence in France ever since the latter date. At present there is only one breeding stud—at Pompadour in Limousin; but there are twenty-two dépôts for sires, the latter being pretty well spread over the country. The law under which the stud and dépôts are now managed, and which was passed in 1874, provides that 60 mares are to be stationed at Pompadour, and devoted exclusively to the rearing of thoroughbred Arab and Anglo-Arab horses. It also provides that the number of sires at the dépôts —in all, 1060 in 1874—shall be increased at the rate of 200 a year until it reaches 2500. In addition to these, 700 sires, after undergoing an examination or sort of trial, are certificated; and thus of the 12,000 stallions said to be in use in France more than one-sixth may be called Government sires. The sires for the dépôts are selected from the best breeds in the respective districts, light or blood horses always having the preference. The stallions intended for getting saddle-horses have to gain admission into the Government haras by public trial; and the care exercised by the Government is well illustrated by the fact that, of 600 horses tried at Caen in the autumn of 1876, only 156 were chosen. The charges for the sires, which are much superior to the general run of entire horses, are very moderate, and the farmers, as a rule, are fairly active in availing themselves of the undoubted advantage thus afforded them. There are complaints, however, that the Government is overdoing the raising of light horses; that, of the light horses reared from the Government sires, little more than one-half find

a profitable market, either for army or other purposes; and that the remainder can hardly be got rid of at any price. For what the Government select for the army, they pay about 46*l.* for heavy cavalry horses, 40*l.* for dragoons, and 36*l.* for light cavalry; but the large number of unsaleable horses left on hand make the rearing of light horses less profitable than these prices would indicate. Farmers find a better market for a moderately heavy-draught horse, and consequently many prefer to use other than Government sires, or at rate to use only the heavier among these.

There can be no doubt, however, that these efforts on the part of the Government have exercised a beneficial influence on the general stock of horses in France. What was seen at Paris this year clearly demonstrated that the French horses are, on the whole, far superior to the rest of its live stock—indeed, several degrees in advance of its general agriculture; and it would seem that a very large share of the credit of this is due, directly or indirectly, to the liberal and systematic efforts of the Government. It may be mentioned that the Government give a large amount of money as prizes for horses at shows, and that State support is bestowed on sixteen schools, which are carried on for the training of horses for the saddle, and for teaching grooms and horsemen. While it may be that these laudable efforts on the part of the Government have done most to improve the breed of French horses, we record with pleasure that English blood has been a powerful instrument in its hands. Indeed, it is since the free use of English blood began—about forty years ago—that the improvement has mostly taken place. But to this we shall refer more fully when speaking of the different breeds.

The export of horses from France in 1874 exceeded the imports by 13,500; and of these over 7000 came to England, which was more than one-half of the total number of horses of all kinds imported into Great Britain in that year. French horses are brought to this country mainly for army purposes, and for omnibus and light waggon work. The Percherons are pre-eminently suited for the two latter varieties of work, and also for the heavier services in the army. For lighter army purposes recourse must be had to the ranks of the Anglo-Norman and Anglo-Arab, of which there is an extensive and valuable supply.

Percheron Breed.—As being, perhaps, the most characteristic, and certainly one of the most valuable, of the French breeds of horses, we shall first refer to the Percherons. Supposed to be of Arabian origin, this breed is said to have been brought into France during the wars in the eighth century. It now presents

little similarity to the light, lively Arab; but great as the transformation has been, it is attributed by most authorities entirely to change of soil, climate, and treatment, and not in any degree to infusion of strange blood. The old county of Perche, lying in the south of Normandy, may be called the cradle of the breed in France. It is devoted chiefly to the rearing of Percheron horses, the colts, as a rule, being sold, and the fillies retained. These colts are employed at agricultural work till three, four, or five years old, and afterwards the majority of them find their way into Paris, and other large towns, where they are used at omnibus and similar work. They usually pass through two or three hands between La Perche and the towns, the selling price in the breeding districts ranging from 10*l.* to 30*l.*, and when maturity has been reached, from 40*l.* to 60*l.* The breed is thoroughly well defined—handsome and valuable; and France has good reason for the pride which she evinces in it. The prevailing colour is grey, but sometimes black is seen; the height is about 15 or 16 hands; the head sometimes heavy and sometimes fine; the forehead broad; the nostrils wide; the eyes bright and intelligent; the neck short and well turned; the mane full and long; the body, back to the last rib, well built and handsome; but the hindquarters and thighs are deficient, and the tail is low set. The shoulders are strong and well sloped; the back is short; from the hooks there is a quick droop; the bone is light and too round; the muscular development good; the feet neat and hardy, and bare of hair; and the action true and lively. In England or Scotland they would be called "light-legged" farm-horses. They are lighter in the body—indeed lighter altogether—than the Suffolk horses of England; but they resemble that breed more closely than either the Shires or Clydesdales. They are, perhaps, the fastest breed of draught horses existing; and for light farm-work, and for running in omnibuses and light waggons, as well as for heavy army-services, they have doubtless few equals. With a moderately heavy load they can pace along at a wonderful rate, exhibiting great endurance and steady draught. For heavy carting, however, and for heavy lorries, and such work, they fall far short of the qualifications of the Shires of England and the Clydesdales of Scotland, and are also inferior to the Suffolks of England. It is contended in France that no draught-breed of horses can nearly equal the Percheron; but, if correct in any degree, that assertion is true only in regard to the lighter varieties of work. At the harrows, or plough, on the farm, or in an omnibus or a baker's van in the town, the Shires or Clydesdales could not be compared to them; but at heavy pulling, and sustaining great weights, these larger British breeds have more than a corresponding advantage in their favour. In Paris, and elsewhere

in France, it is no unusual sight to see half-a-dozen Percheron horses dragging away at a load which would be easy work for a pair of good Shires or Clydesdales. Indeed, one needs but to see and examine the Percheron breed to know that its forte is moderately light work, in which speed is a leading element. Just as surely does an inspection of the Shires and Clydesdales mark them out as above all others the proper horses for "heavy lifts." We do not think that the importation of Percheron horses would be an acquisition to British farmers or others who have heavy draught-work to perform; nor do we think it likely that an infusion of Percheron blood would exercise a beneficial influence on our stock of heavy-draught horses. For light-draught work of all kinds the greys of France are admirably suited; and any deficiency in our home supply of horses for these purposes might well enough be met by drafts from their ranks. Already their suitability for these purposes has been well proved in England; for a few years back they have been used in large numbers in London, and other large English towns. In America, too, they have earned a high reputation, and a great many sires have been drawn away there at long prices.

The display of the breed was large and of very high merit, and formed one of the most prominent features of the Show. So many handsome horses of similar type—so uniform, in size, character, and gait, could not fail to prove an attractive sight. A large share of the prizes fell to their lot.

Other Draught Horses.—Throughout France, as in most other countries, there are a great many varieties of draught horses, though only two or three could be called distinct well-defined breeds. Judging by the specimens exhibited at Paris they are, as a rule, lighter in the body, with less muscle and rounder bone, than British draught horses. We have already said that we did not think that the importation of Percheron horses would be an acquisition to British farmers and others who employ heavy-draught horses; and still less advantageous, we think, would be the introduction, either directly or by crossing, of any of the other draught breeds of France. There may be faults in our heavy-draught horses—undoubtedly there are. But we have not seen anything in the French breeds that would lead us to recommend them as likely to eradicate those faults. France has gained much, and she may gain still more, by the infusion of English blood into her live stock; but in the meantime, at any rate, we do not think it likely that any advantage would accrue to Great Britain by a reversal of the process either in regard to horses, cattle, sheep, or swine. As already hinted, however, any deficiency that may exist in our own supply of light-draught

horses and of horses for army remounts might well be met by having recourse to the Percherons and Anglo-Normans of France.

The Brittany draught horses resemble the Percherons pretty closely, and are similarly bred. Their origin is also Oriental; and between Perche and the north, where the best class of Brittany draught horses are reared, a constant interchange of blood has been going on. Brittany rears but very few of the many horses it breeds, the majority going when quite young to Normandy, where, Mr. Richardson says, the greys are known as Percherons and the bays as Normans. Norfolk trotter-sires have been used freely in some parts of Brittany during recent years, and the specimens we saw of this cross were hardy, useful-looking, light horses, well adapted for "vans" and such work. The Norfolk Cob sires have evidently been very successful in raising horses to suit French ideas, for during the past few years the demand for stallions of this type has increased greatly. At La Baude, in Cher, a local breeding-stud for draught horses was established in 1874, the sires selected being of the type of the Norfolk Cob. In Nivernais, the Society of Agriculture has been making endeavours to improve the local breed of horses—and have met with gratifying success—by the introduction, at high prices, of choice black Percheron sires, of which a few very good heavy specimens were shown.

Some of the heaviest draught horses in the French classes belonged to the Boulonnais race, which has its headquarters in the Pas de Calais, and which is not unknown in England. As a rule, the breed is thicker and more powerful than the Percherons, and better suited for the heavier varieties of work. Their hind-quarters are better formed than those of the Percheron, while their legs are shorter and stronger; but their action is slower, general appearance less gay, and quality coarser. Withal, however, they seem to be a thoroughly profitable class of draught horses. They stand over 16 hands, are usually dark grey or black in colour, strongly built, short thick neck, good chest, shoulders strong but not sufficiently sloped, and bone rather round. They enjoy a good name for their working powers, and they appear worthy of it.

The special prize of an "Object of Art," offered by the Agricultural Society of France, for the best group of "heavy-draught" (*gros trait*) horses, was awarded to a group of very fine Boulonnais horses shown by M. Modesse-Berquet, of Any-Martin-Rieux, Aisne. In the contest for the latter premium, Mr. Lawrence Drew, Merryton, Scotland, exhibited one of the finest groups of British heavy-draught horses that has ever been placed before Judges; and, with all due respect to French ideas, we cannot

agree with the award in favour of the gay but light French group. The decision practically amounts to this, that by Frenchmen the Boulonnais horses are considered superior to the Shire and Clydesdale horses even for "*heavy* draught,"—an opinion with which few who know anything of those British breeds will be inclined to concur. In the same contest, a very fine group of Percheron horses, shown by the Paris Omnibus Company, were, like Mr. Drew's mares, awarded a well-deserved diploma of honour. It was evident that the French could not understand the size and weight of our heavy horses. An English visitor had two or three of Mr. Drew's and Mr. Garrett's horses "trotted out" to show them to some French friends who really appreciated them, but the remarks of the bystanders, made with all freedom, amounted to this:—"My dear sir, this isn't a horse, it is an elephant."

Anglo-Norman Horses.—As the name would indicate, this race has been formed by a cross between English sires and Norman dams. It claims an age of about forty years, and occupies a prominent position among the French breeds. The ancient carriage and saddle horses of Normandy, though useful and hardy, were coarse and not very handsome; and an attempt was made to improve their form and quality by an infusion from English thoroughbred sires. Now and again the result has been successful, but it is spôken of as having been very uncertain. The Norfolk Cob next got a trial, and in this case the result has been, as a rule, satisfactory. Indeed, it is mainly through the agency of the Norfolk Cob that the Norman horses have been brought to what they are—a thoroughly good class of carriage and saddle horses. Though the English thoroughbred sires were not successful alone, it is the general impression that their contact with the Norman breed materially aided the Norfolk sires. At the dispersion, in 1874, of the stud of Anglo-Norman horses—a stud that contained a large percentage of English blood—belonging to the late Marquis de Croix Serquigny, 7 young mares brought an average of 130*l.*; 8 aged mares, 174*l*; 12 yearlings, 71*l.*; 9 two-year-olds, 112*l*; 4 three-year-olds, 180*l.*; 7 four-year-olds, 172*l.*; and 10 horses in use, 153*l.* each. Trotting-matches are held throughout France in great numbers, and the records of the Anglo-Norman horses are highly creditable.

Though bred in the same province, the Anglo-Normans have never been crossed to any appreciable extent with the Percherons, and the real Anglo-Normans are nearly as uniform in stamp as the race of greys. We say real Anglo-Normans, because the good name that the race has acquired has tempted horse-dealers to pass off for Anglo-Normans many horses which really have very little English

blood in them. In height, the Anglo-Normans vary from 15 to 16 hands, the average being about 15·3. Dark bay in colour, they are lively blood-looking animals, well adapted for carriages. The truer specimens are elegant and well formed, perhaps a trifle long in the limbs, but fairly provided with muscle; flat and fine in the bone; feet clean and firm; head fine; nose straight, eyes bright, ears small; neck light and graceful; shoulders long and sloping; the body usually handsome and well ribbed up, but frequently rather light; their mane and tail are full, and their general gait and action lively and graceful.

The turn-out of this breed made up a large portion of the French display of horses, and formed in itself a very grand show. In the parade before the jurors, the Anglo-Normans, as a rule, exhibited excellent action, good looks, fine quality, and fair substance. There was perhaps a tendency to an excessive length of legs, and a lightness all over; but, on the other hand, a large number were well knit, flat and clean in the bone, with good muscle, fine heads, sleek skin, and silky hair. High in spirit, and very lively, their action was often faultless, "corky," and graceful. Most people who saw the appearance they made at Paris would admit that the Anglo-Normans are a thoroughly good and useful class of light-legged horses. The race deserves careful tending, and is, in fact, well worthy of further pains and expense being devoted to its amelioration. A little more substance and muscle, and in many cases more quality, might be infused with great advantage. Selection in breeding, and improved treatment, would, no doubt, accomplish much of this; but past experience proves that gain would result from a larger infusion of English blood. It is worthy of mention, that the stud which carried the champion prize of 3000 francs for the best collection of horses—that belonging to M. J. Lefèvre, of Chamant, Oise—contains a large proportion of Norman blood, as well as some of the best English strains.

Other Light-legged Horses.—Brittany is spoken of as being the largest nursery of horses in France, and is said to contain more than one-tenth of the whole stock of horses in the country. The ancient Brittany breed is supposed to have been brought from the East in the twelfth century; but, like the Percherons, they now present few of the characteristics of pure-bred Oriental horses. In the south and centre of Brittany, Arab, Anglo-Arab, and Anglo-Norman horses have been extensively used, and in these parts there is a large stock of useful light carriage and saddle horses. From Finistère, particularly, there was a very good muster of these light horses; and, both in the carriage and saddle classes, they obtained a fair position in the list of awards. They averaged over fourteen hands, and some reached sixteen,

while they seemed a very hardy useful lot, not in every case handsome. In front they are well formed, chest broad, shoulders sloping, action good, and colour usually chestnut or grey. As light saddle horses they would command esteem in any country. For the heavier saddle work in the army, however, they want substance and muscle; while for fashionable carriage horses their quality, character, and looks need improvement. In La Manche, Orne, Mayenne, and Poitou, the breeding of light carriage and saddle horses is pursued extensively; but the bulk of the produce are sold while young for conversion into "Norman" horses. Of both Orne and La Manche horses the muster in the carriage and saddle classes was highly creditable, and between them they snatched a moderate share of the honours from the famous Calvados horses, whose success was quite remarkable.

Thoroughbred Horses.—Of English thoroughbred horses and mares there were sixty-three entries, of which sixty belonged to France, two to Italy, and one to Austria. Though there might have been differences of opinion among authorities as to the real average merit of the display, it was admitted on all hands that it was on the whole highly creditable to France, and that it contained several animals that would have graced the finest collection of thoroughbreds that has ever been exhibited in England or anywhere else. M. Lefèvre, of Chamant, Oise, whose fine lot won the 3000-franc prize for the best turn out belonging to one exhibitor, showed several beautiful animals, and got the first and third prizes in the stallion class, and first among mares. His winner in the former class was the well-known horse "Flageolet," who, in 1873, beat the two Derby winners, "Favonius" and "Cremorne," for the Goodwood Cup. He is now eight years old, and showed himself in grand form, displaying magnificent action, and wonderful muscle. M. Lupin's equally celebrated six-year-old chestnut "Salvator," by "Dollar," who has also well sustained his good looks, made an excellent second, the decision against him being given by the casting vote of the Chairman of the jury. "Salvator," it will be remembered, won the Grand Prize of Paris in 1875, and has been on hire during the past season in the Neasham stud, near Durham. The third prize fell to a horse perhaps better known on the turf than either of these two, namely, M. Lefèvre's "Mortemer," whose produce have already won, among other honours, the Two Thousand Guineas, the Grand Prize of Paris, and the Ascot Cup; among his produce being "Verneuil," "Chamant," "St. Christophe," and "Clementine." "Mortemer" is now thirteen years old, but looked fresh and lively, and well deserved his position. Among the unsuccessful horses was "Plutus," the sire of "Flageolet."

M. Lefèvre's "Regalia" won easily in the mare class, which, considering the strong opposition, is high honour to her owner. Got by "Stockwell," this fine old mare is out of "The Gem," the winner of the Epsom Oaks in 1865, and the dam of "Verneuil" and "Clementine." For the second place there was a very close contest, opinion among both the jurors and the onlookers being somewhat divided. Ultimately the handsome twelve-year-old bright chestnut "Mademoiselle-de-Fligny," by "Bois-Roussel," owned by M. Grégoire, of Almenèches, Orne, was put second; the third prize falling to the equally gay eleven-year-old, "Finistère," got by "Tournament," and belonging to the Haras of Villebon, in the Seine-et-Oise. Two fine stable companions of "Regalia"—"Reine," the winner of the One Thousand Guineas and the Oaks, in 1872, and "Camelia," who won the Newmarket race, and ran a dead heat for the Oaks with "Enguerrande"—were regarded by many as deserving of positions in the prize list. The former, however, was entirely passed over, while the latter got only a bronze medal. Bronze medals were given to other fine mares, but we think the standard of merit and the number of entries in the class were sufficient to have justified the awarding of at least two or three supplementary prizes.

Of pure Arabian horses there were ten entries belonging to France, the display in point of merit being good. The first prize in the stallion class went to a Russian horse, but the second was retained in France, by "Simoun," a gay little greyish mare, owned by M. Curial, of Thiviers, Dordogne. The honours in the mare class went to animals from Cantal, and the Lower Pyrenees—very fair specimens of the breed.

France showed nine thoroughbred Anglo-Arab horses, a race which includes all "those horses that have in their pedigree at least a sire's sire or a dam's dam of pure Arabian blood, the other progenitors being all thoroughbred English horses." Here again Russia carried the highest as well as the third premium in the stallion class, the other honours falling to French horses—animals showing good muscle and fair quality.

Belgian Horses.

The draught horses of Belgium have long had a good reputation in England and Scotland, and perhaps a greater number of them have been imported into this country than representatives of any other foreign draught breed. They could not claim a high position for their good looks, but they are hardy, active, useful horses, and adapt themselves wonderfully well to the climate of Great Britain. They are a trifle heavier than the Percherons of

France, and can be bought for less money. They are not so handsome, however, nor can they go over the ground so quickly under a load. The Belgian display consisted almost wholly of these draught horses; and it must be admitted that, from an Englishman's point of view, they were entitled to rank above the general run of French draught horses. They are neither so high nor so heavy as the Suffolks of England, but they come nearer to that breed than does any French race. They were represented in all the draught classes, and got a fair share of the honours. In the classes for horses and mares over four years old and under 16 hands high, in particular, they had a very creditable victory, having carried off against some good Percherons two of the three first prizes in each. It may be explained that, in the mare class there were several very fine British animals, but the British Juror having refused to accept for any of them less than a first prize, the three best were awarded each a supplementary prize, the ordinary prizes being left to the French and Belgian horses. In the stallion class referred to, there was only one English horse, and both by the Belgian and French horses he was fairly enough beaten. From our note-book we find that some of the Belgian horses were short and thick, with rather round bone, but very good muscle; that they nearly all had what is called a Roman nose, and were all a little slack on the back; that the prevailing colours were bay and chestnut; that most of them had good forearms, broad chests, expressive eyes, rather coarse and heavy heads, small ears, short thick neck, plain hind-quarters, and deficient flank and thighs; that several had bad feet, and only fair quality, and that a good many were unsound in the legs. The light-legged horses shown from Belgium were only fair. Indeed, the Roman nose and hollow back are leading characteristics of the Belgian, or Flemish, horses, as they are more commonly called.

Austrian Horses.

During recent years the Austrian Government has done a great deal to improve the native breed of horses, particularly those suited for carriage, saddle, and general army purposes. At numerous points choice sires are stationed, and let to breeders at from 2*s.* 6*d.* to 30*s.* per mare; while there are several Government breeding-studs at which thoroughbred and other horses are reared. Many of the Hungarian landowners, too, have private breeding-studs of their own, and raise a class of horses scarcely inferior to the best specimens bred by the Government. The Austrian muster consisted wholly of light-legged horses, and the majority were shown by the Government. As a rule, they were bay in colour, neatly formed, with fine bone, good quality, ex-

cellent action, gay carriage, and fine expression; but they were light in the body, wanting in substance and muscle, and, in most cases at least, rather long in the limbs. A few, too, were common-looking, and lacked the hardy useful appearance which characterises the Anglo-Normans. For general army purposes the Austrian Government horses want both weight and muscle, but for lighter work they should prove satisfactory. The Austrian, like the Russian, stables were largely patronised by the public, the attractions of the equine display being enhanced by the odd appearance of the grooms, who were attired in their somewhat eccentric-looking national costumes.

Russian Horses.

The Grand Duke Nicholas had a whole stable to himself; and perhaps no other part of the Show received so much patronage from the public. He showed no fewer than 17 stallions—3 pure Arabians, 2 Oriental, 1 Anglo-Arab, 5 Orloff, the others being mixed-bred. As already stated, the first prizes both in the pure Arab and Anglo-Arab stallion classes were won by the Duke for horses which he rode during the recent Russo-Turkish war, namely, "Rustchuk" and "Drouze." These were both handsome horses, and found many admirers, but of the others, the majority were not particularly fine.

Other Foreign Horses.

From Italy a few very good light-legged horses were shown, the principal exhibitor being the Count Telfener, Rome. Most of them were rather sleepy-looking, and a little plain in form; but they had fair bone, good muscle, and fair quality. Six draught horses were shown from Denmark. They were long and light in the legs, and round in the bone, and not heavy in the body; but were neat in form, with fair muscle, soft and silky hair, and full tail and mane.

Agricultural Implements.

Not the least interesting department of the Paris Exhibition was that occupied by agricultural machinery. The display, *en masse*, was extensive, and of such a high order that it drew large crowds of intelligent and appreciative visitors. The annexes, particularly of Great Britain, the United States, and Canada, were carefully inspected, and in each there was much to interest and repay close examination. Few implements, however, of importance, entirely new, were to be seen in any of the collections. During the past year or two, since the inven-

tion of the sheaf-binder, there has been no very material addition to the list of labour-saving machinery. Not that the inventive genius at the command of agricultural implement makers has been unemployed or inactive; but it would seem that for the time attention has been devoted more to the perfecting of previously invented implements than to the introduction of new ones. It must not be imagined that the time thus spent has been lost or misused. Indeed, at the Paris Exhibition there was abundance of proof that it has not been so, for while we saw no implements of great importance that could be called altogether new, we observed many minor inventions newly attached to old machines, which must be regarded as real improvements.

A very lengthy report on the agricultural implement department of the Exhibition would only bring the readers of this Journal over ground already familiar to them. By more competent pens the subject has been fully treated of from time to time in the 'Journal;' and in this number there will appear a valuable contribution from another source. Brief reference to the more prominent features of the various collections at Paris will therefore suffice.

British Implements.

England's superiority in the manufacture of agricultural implements has often been clearly demonstrated, and was once more placed beyond doubt. As might have been expected, considering the cost of transit, the British collection was not large; but it was very select, and included consignments from almost all the better known English makers. There was perhaps less brilliancy of polish than in the American annexe, but the English display presented a fineness of execution and finish, combined with substantiality, which could not be found in the same degree in that from any other nation. Every Englishman who visited the English annexe felt proud of the production of his country, while all impartial foreigners acknowledged its superiority. And in the collection there was a good deal to interest the foreigner, for, in addition to a varied assortment adapted to home use, it contained many implements specially constructed for the agriculture of foreign countries. Several English makers have recently been devoting considerable attention to the production of implements for foreign use, and have met with gratifying success.

Commencing with implements for the cultivation of the soil, we may state that among the English exhibitors of these were Messrs. J. and F. Howard, Bedford; Messrs. John Fowler and

Co., Leeds; Messrs. Ransome, Sims and Head, Ipswich; Messrs. Barford and Perkins, Peterborough; Messrs. Coleman and Morton, Chelmsford; Messrs. W. Ball and Son, Rothwell; Mr. J. P. Fison, Cambridge; Mr. Denton, Wolverhampton; Messrs. Hornsby and Sons, Grantham; and Messrs. Rainforth and Sons, Lincoln. The collection of the Messrs. Howard included steam engines adapted to the combined purposes of ploughing, threshing, grinding, hauling, and other farm work; steam ploughs, steam cultivators, steam harrows, steam scarifiers, single and double horse ploughs, potato-ploughs, vine-ploughs, &c. The arrangement of their steam plough and subsoiler has been so improved that the wheels always run on the unploughed land, which both reduces the draught and leaves the ploughed land unpoached; while their twin steam cultivator can now be folded up to pass through 9-feet gates and to travel on roads. On both twin and single cultivators a simple but effective automatic appliance has been introduced for lifting the teeth out of the ground at the turnings, which renders it unnecessary for the driver to leave his seat. The smaller ploughs, for which the firm have long been justly celebrated, have also been further improved by the incorporation of an appliance for raising the implement out of the ground at the turning. A plough, which may be used either as a double or single furrow plough, was exhibited by this firm for the first time at the Smithfield Show last year, and was on their stand at Paris. It is a simple, substantial, and very useful implement, and may in a few minutes be converted from a double to a single-furrow plough with or without wheels, and *vice versâ*. It will plough from 7 to 14 inches deep, and the depth can be altered without stopping the horses. Several small but useful improvements have been made in their harrows.

Messrs. Fowler and Co. exhibited in the agricultural section two of their celebrated traction steam-ploughing engines; one 16-horse-power representing the large, and the other 6-horse-power, representing the smallest type of this class of machinery made by them. The former showed some novelties of construction. The boiler is made of steel, and the boiler barrel—a fine piece of workmanship—of a single steel plate. The valve (Church's Patent) is circular in shape, and turns freely within a circular ring moved by the valve-spindle, the steam-ports being of a corresponding circular form. This allows the valve to turn freely round itself whilst moving backward and forward in the usual manner, keeping thereby the valve-seat and its own surface straight and smooth. Besides, it is partially relieved by a disc-plate bolted to the valve-seat, and touching the upper part of the inside of the valve. A saving not only in wear and

tear, but also of power, is effected by the adoption of this plan. The smaller engine, an exact counterpart of the larger, has recently been constructed with the view of meeting a growing demand for steam cultivation on small estates and limited farms, and is a beautiful piece of workmanship. Numerous ploughs of various kinds, four-furrow, three-furrow, double and single, constructed for British agriculture, as well as for sugar-cane fields, and other foreign cultivation, were shown by this firm, as were also cultivators and harrows adapted to various countries. The three-furrow plough, specially constructed for sugar-cane fields, deserves particular notice. The main plough-beam, instead of being a straight angle-iron diagonally extending over the single plough, is bent into a zigzag, so as to give plenty of space for roots and cane-stools to pass between the ploughs. The plough middle, by which the frame is supported, is capable of swinging freely round a vertical stud. Thus, in going over the ridges of an old cane field, especially if these ridges are slanting to the furrow-line, the shock which the land-wheel constantly receives does not communicate itself to the main frame, and the latter retains its position, undisturbed by the unevenness of the ground. Models of some of the more novel implements invented and made by Messrs. Fowler and Co. elicited much admiration, more particularly those of the implements constructed specially for the Duke of Sutherland's reclamation works in the far north of Scotland.

On the stand of Messrs. Ransomes, Sims and Head, were ploughs made specially to suit the requirements of New Zealand and the other Colonies, the corn-growing districts of Southern Russia, Egypt, India, China, and South America. One of the New Zealand ploughs is a new double-furrow implement, fitted with circular coulters, and specially adapted for breaking up grass-land after it has been used as pasture for sheep. The ploughs for Southern Russia and the east of Europe are single, and constructed to turn a large furrow, and to break up the soil, instead of laying the furrow-slice at an angle of 45°, as in the English system. The Indian and Egyptian ploughs are simple and primitive looking.

Messrs. Hornsby and Sons' stand contained a beautiful 8-horse-power portable steam engine, suitable for all ordinary kinds of farm work to which steam engines can be applied, as also two ploughs constructed mainly for Continental countries. One of the latter was a three-furrow implement, substantial and light in make; the other a single-furrow plough, with a neat arrangement of wheel and rest for carrying the implement round when out of work at the headlands.

The collection of drills and broadcast sowers was large and

varied; the chief English exhibitors having been Messrs. R. Garrett and Son, Suffolk; Mr. James Coultas, Grantham; Messrs. Holmes and Sons, Norfolk; Messrs. Kell, Meats, and Co., Gloucester; Messrs. Rainforth and Sons, Lincoln; Messrs. Corbett and Peele; Messrs. James Smyth and Sons, Suffolk; Messrs. Woolnough and Co., Kingston-on-Thames; and Mr. Gilbert, Berkshire. Many of these implements showed minor improvements, particularly in the way of increasing the facilities for varying the outlet of seed, and of adapting the machines to foreign countries; but none call for special mention.

One of the leading features of the British display was the magnificent muster of reapers and mowers and other implements used in the harvesting of crops. The exhibitors of these were numerous, among them being Messrs. Hornsby and Sons; Messrs. Howard; Messrs. Samuelson and Co., Banbury; Messrs. Aveling and Porter, Rochester; Messrs. Picksley, Sims and Co., Leigh; Mr. G. Kearsley, Ripon; Messrs. Burgess and Key, London; Messrs. Harrison, McGregor and Co., Leigh; Mr. Bamlett, Thirsk; Messrs. Ruston, Proctor and Co., Lincoln; and Mr. Neale, London. Among a collection of these well-known reapers and mowers and other harvesting machines, made by Messrs. Hornsby and Sons, there was the five-arm spring-balance self-raker for two horses, with an ingenious arrangement by which the driver without leaving his seat has control over the rakes, and can at will cause them to deliver the cut crop lying on the platform, or to pass it over to make a larger sheaf for delivery by the following or any other rake. The arrangement may be fixed to work automatically, and can yet be varied at will, adapting the machine to all kinds and states of crop, and the customs of different localities and countries. In the 'Paragon' Grass-mowers some recent improvements were seen, notably a new spring slide for holding the connecting-rod in the knife, and a spring stop for keeping the knife in its place; a new arrangement for throwing the machine in and out of gear by a slight movement of the driver's foot, and a spring catch for holding up the finger-bar when travelling. Messrs. Howard have introduced in their reapers and mowers an open gearing, which, among other advantages, is light in weight, of great strength, and prevents earth or anything else from embedding and endangering the teeth. The arrangement for allowing the knife to be drawn out and replaced has also been simplified by the substitution of springs for bolts, pins, and screws. One of the leading features of this stand was the sheaf-binder constructed by the Messrs. Howard, which was exhibited at Bristol. Of it we need only here say that in Paris it attracted a good deal of attention, though, of course, it was not tried in the fields

there. Mr. M. J. Neale's string-knotting sheaf-binder was also exhibited, and was minutely inspected by many. Mr. Neale's invention is ingenious, and has the lead of all other binders in respect that string-binding has advantages over wire; but of course it is one thing to look at an implement and another to see it put to the practical test in the field. Another curiosity among harvesting machinery is Messrs. Aveling and Porter's steam reaping machine, not unknown to English agriculturists. This mechanical monster is driven by an 8-horse-power locomotive crane-engine, and cuts 12 feet wide. It is stated that about 30 acres ought to be cut in a day with this implement, which, in construction, does not differ much from the old reaper. Messrs. Samuelson and Co.'s reapers exhibited several serviceable alterations; such as an appliance for controlling the rakes, with the view of regulating the sheaves; self-cleansing fingers, of the open pattern, preventing accumulation under the knife; a new near-side shoe and knife-slide, giving greater facility for the removal thereof; new means of rapidly raising and lowering the height of the cut; means of putting in and out of gear with the driver's foot; a head-lifter working in conjunction with the rake; and last, but perhaps the most important of all, new fingers of welded steel and iron. The judicious use of the materials composing this finger not only permits of a lighter weight and improved form, but also a greater proportionate strength, while they dispense with steel-rivetted plates which sometimes cause annoyance by getting detached from the ordinary malleable-iron fingers. Mr. Kearsley, besides other improvements, has introduced in his machines a lifting-lever to enable the driver to raise the outer end of the finger-bar to pass over any impediment. Several other reapers and mowers showed various minor improvements too numerous to mention.

An object of interest on the Stand of Messrs. Ruston, Proctor and Co., Lincoln, was Mr. Loader's harvesting-machine, which may be used as a hay-maker or for loading hay or corn. It is asserted that it will load a ton of hay or corn in five minutes, with the assistance of two men to place the hay or corn when delivered on the waggon or cart. Few implements earned a better reputation in the Exhibition. Of hay-makers and horse-rakes there was a large and varied assortment, but nothing strikingly novel.

In few classes of agricultural implements has greater improvement been recently made than in threshing and dressing-machines. They formed a large display at Paris, and in detail several important alterations were noticeable. Accidents to persons employed in feeding these threshing-machines formerly occurred so frequently, that, by Act of Parliament, manufac-

turers are now required to provide drum-guards; some of those exhibited were very ingenious, and all efficient. Messrs. Ransomes, Sims and Head exhibited a threshing-machine designed for hot countries, where straw contains a larger amount of saccharine matter and silica than that grown in cold countries, and where, in consequence, animals' mouths are apt to be damaged in the masticating of the strong woody fodder, unless it is cut or bruised in some fashion. In this machine the process of threshing and cleaning the grain is performed in the same way as in the ordinary machine; but instead of the straw falling from the shakers to the ground, it passes into a hopper, in which are two rollers revolving at a high speed—one fitted with a series of sharp knives, which cut the fodder into lengths of about 2 inches, and the other studded with blunt projections, which split and soften the straw in the same manner as when the grain was trodden out under the feet of animals—the ancient process of threshing in Eastern countries. Efficient bruising and chopping apparatuses were also attached to the threshing-machines shown by other manufacturers, notably those of Messrs. Garrett and Sons, of Leiston, and Messrs. Clayton and Shuttleworth, of Lincoln. A self-feeding apparatus, with a contrivance for dividing the sheaves, has been adopted by Messrs. Ruston, Proctor and Co.; while Messrs. Hornsby's celebrated portable threshing, shaking, finishing, and dressing-machine, with reversible drum, has been slightly improved. Messrs. Robey and Co., Lincoln, exhibited a threshing and dressing-machine with wrought-iron frame, which they claim to be both light and strong—much stronger than a wooden frame. A threshing-machine specially adapted to France was shown by Messrs. Marshall and Sons, Gainsborough. Among the other exhibitors of this class of implements were Messrs. Davey, Paxman and Co., Colchester; Messrs. Holmes and Sons, Norwich; Messrs. Turner, Ipswich; Mr. Fison, Cambridge; and Mr. E. Humphries, Pershore, Worcestershire. Several superior grinding-mills were shown; but there was little that could be called new among them. Mr. J. Harrison Carter, Mark Lane, London, showed a middlings roller-crushing mill, which is intended to introduce into England the Hungarian system of high grinding, and which it is predicted will by-and-by become popular in this country. It is constructed with chilled iron rollers, for the grinding of middlings or the better parts of wheat.

Some very efficient grain-dressing machines were also exhibited. Perhaps the most notable of these was the combined winnower, elevator, and weigher, which attracted so many visitors to the Stand of Messrs. Corbett and Peele, of Shrewsbury. The elevator stands at the end of an ordinary winnower, and is

operated upon by a band from that machine. "As the grain passes from the winnower it is taken up by a series of cups, and delivered into the hopper of the elevator, and, passing through the spout, fills the bag which sits on the weighing-machine. The weight required is placed on the back of the weighing-machine, and when sufficient has fallen into the bag, the descent of the weighing-machine disengages the catch (connected to the machine by a cord), and the supply is instantly cut off, not a grain being wasted." The combination is happy, useful, and simple, and elicited much admiration both from foreign and English visitors. The construction is so perfect, that it is very easy work for one man to drive the machine; and all the other manual labour required is one person to put the grain into the winnower, and to remove the bags when full. His Royal Highness the Prince of Wales closely inspected the combination, and tested the motive-power it required when in full operation, remarking, we were informed, as he left it, that a child might turn it. This firm, very justly, enjoys a good name for the manufacture of winnowers; and in those exhibited at Paris there were some further improvements worthy of notice. One is an arrangement whereby the same motion is secured at both ends of the riddle. The riddle rests in front on a sliding bar, and hangs on chains behind; and is driven at the centre by a crank-wheel connected to a fan-spindle by bevel gear. Small as this change is, its importance will be easily conceived, especially in the dressing of damp or inferior grain. In addition to this, a brush has been attached beneath the bottom-oscillating screen, which greatly facilitates the cleaning of the meshes. Messrs. Davey, Paxman and Co.'s steam corn-dryer, well known to the readers of this Journal, was much admired.

Of smaller implements, such as chaff-cutters, corn-crushers, root-pulpers, cake-breakers, &c., there was almost an endless variety; but though they exhibited improvement there was no radical change. In the fine collection shown by Messrs. Richmond and Chandler, of Salford, was a chaff-cutter provided with a lever for reversing the movement of the rollers, both the rollers and the feeding web being instantaneously reversed by one movement of the lever. Thus, as soon as the feed is run back the web carries it away from the rollers, rendering it impossible for them to catch it on their points or carry it round with them. Messrs. Riches and Watts, of Norwich, exhibited several of their celebrated 'Felton' and 'Eureka' grist mills; one of the former was shown on a strong four-wheel carriage, with wrought-iron axles, and wrought-iron spoke road wheels, upon which a chaff-cutter was also fixed. The two machines may be worked together or separately, and when fitted with a chaff-cutting

apparatus, they form a handy combination for farmers. A new turnip-cutter, arranged so as to cut the roots into three different sizes, was exhibited on the stand of Messrs. Woods, Cocksedge and Co., Suffolk, while Messrs. Penny and Co., of Lincoln, showed a potato digger and a potato separator, both of which should work well. Messrs. W. Smith and Son, of Kettering, Northamptonshire, exhibited a rotatory turnip-thinner for two rows, which was inspected with interest. No mechanical contrivance, however, has ever yet satisfactorily accomplished this somewhat difficult operation. On the same stand were to be seen two well-constructed horse-hoes, one of which is a new design. An improved turnip-thinner was also shown by Messrs. Holmes and Sons, of Norwich. Messrs. Picksley, Sims and Co.'s display of chaff-cutters, cake-mills, grain-bruisers, root-cutters, &c., attracted the attention of visitors, as also did the stand of Messrs. Carson and Toone, of Warminster, Wiltshire, on which were three superior horse-hoes, easily convertible into grubbers. Ornamental and plain entrance and field gates, various kinds of wire-netting, garden and field rollers, and similar articles, were exhibited by Messrs. Hill and Smith, of Brierley Hill, Dudley; Messrs. Brown and Co., of Cannon Street, London; Messrs. Barford and Perkins, of Peterborough, and others, while some excellent liquid-manure carts, with distributor and pump, were shown by Messrs. W. Ball and Son, of Rothwell, Northamptonshire.

As was to have been expected, portable, traction, and fixed steam engines adapted for agricultural purposes formed a prominent feature of the British display. Among the exhibitors of these not already mentioned were Messrs. Robey and Co.; Messrs. Ruston, Proctor and Co.; Messrs. Aveling and Porter; Messrs. Ransomes, Sims and Head; Messrs. Clayton and Shuttleworth; Messrs. Marshall, Sons and Co.; Messrs. J. and H. McLaren, Leeds; Messrs. Turner, Ipswich; Messrs. Tuxford and Sons, Boston, Lincolnshire; Messrs. Davey, Paxman and Co.; Messrs. Barrows and Stewart, Banbury, Oxford; Mr. Hindley, Bourton, Dorsetshire. On the stand of Messrs. Ransomes, Sims and Head, the well known engine patented by Head and Schemioth for burning straw, cotton, maize-stalks, and other vegetable fuel, as well as wood and coal, occupied a prominent position. This engine, if we mistake not, made its first public appearance at the Vienna Exhibition in 1873; and its construction was fully reported upon in this Journal by Professor Wrightson (second series, vol. x. part 1, p. 71). Since that time many hundreds of these engines have been introduced into Russia, Hungary, Egypt, India, and many of the Colonies, where ordinary engines can hardly be used for

want of coal. In Russia they are chiefly employed at threshing, straw being used as fuel, while in Egypt, where the refuse cotton stalks compose the fuel, they are used mainly in irrigation works. Apparatuses for accomplishing a similar object have been patented by Messrs. Garrett and Sons; Messrs. Ruston, Proctor and Co., and by Messrs. Clayton and Shuttleworth; and these firms claim that their inventions are quite as efficacious as that of Head and Schemioth, which has been licensed to other firms besides Messrs. Ransomes, Sims and Head. The patent of Messrs. Garrett and Sons introduces no complication on the engine with the exception of the hopper before the straw burning grate. The straw is introduced by means of a fork in light parcels or wisps, where it is thoroughly dried before ignition; and each wisp is pushed forward by its successor into the fire-grate, where combustion instantaneously takes place. Messrs. Ruston, Proctor and Co. have introduced patent expansion stays on their engines, and have fitted them up with variable expansion gear, while Messrs. Robey and Co.'s fixed engine shows some important novel features. The boiler is connected with the engine by being bolted to the cylinder-end only, and carried by rollers, working in grooves, at the fire-box end,—an arrangement which relieves the boiler of all strain. The engine lies under the boiler, and is thus kept in a rigid position. The workmanship displayed by many of the English engines was not excelled, if indeed equalled, by anything in the Exhibition.

The only Scotch firm represented in the implement department was that of Messrs. Reid and Co., of Aberdeen, whose crowded little stand had many visitors. Their patent "Disc" drill and broad-cast sowers, well known and extensively used in various parts of the country, added to their fame by their appearance at Paris; which may also be said of the tidy, compact, and efficient hand and foot threshing machines made by this firm, only the latter machine is newer than the former.

Machinery from Other Countries.

United States.—From the United States there was a small but very select collection; binders, harvesters, reapers, and mowers forming its leading feature. The American reapers and mowers have earned a higher reputation in France than those of English make, chiefly on account of their lighter build; and we believe an extensive sale was obtained for the better class of these machines. Messrs. J. H. McCormick and Co.'s wire sheaf-binder, which has this season acquired so much fame, drew many visitors to the American annexe and elicited universal admiration. A well-known authority says that it has been so

much improved since last year that as a wire-binder it leaves little to be desired. Mr. Walter A. Wood's celebrated binder was also forward, its ingenious and efficient construction attracting much attention. This machine, the first of the kind which came before the public, has also undergone some improvements since last year, and is drawing a large trade to its enterprising maker, whose output of separate machines in 1875 was over 23,000. Of Mr. Wood's well-known reapers and mowers there was a large and interesting display. Their superior construction and finish were generally and favourable commented upon, and we observed some small improvements. In some the plan of removing the knife has been simplified; one has been improved by a modification of gearing, which is placed on the spindle; the cutter-bar in another is attached both to the frame and to the cover in front of the knife-crank, which secures greater strength. An arrangement has also been introduced for controlling the rakes, which may be made to work automatically. The Johnston Harvester, shown along with a collection of other well-finished machines, by the Johnston Harvester Company, of Brockport, New York, came in for a fair share of attention. This ingenious machine, by its light draught, durability, and efficiency, has gained a good name in France; and recently it has undergone some improvement. "The main frame is connected with the pole by a leverage, and works up and down as required on an upright shaft, the pitch of the fingers being regulated by a second leverage, which acts on the hind part of the platform. The rake shaft is driven by a pitch chain, regulated by tension pulleys." A recognised authority gives it as his opinion that a change of trip-wheels is desirable in order to alter the action of the rakes. A string-knotting machine, made and exhibited by this firm, formed one of the leading novelties in the agricultural implement department. The mechanism is very ingenious and, of course, complicated, but it seemed to stand the tests admirably. Messrs. Warder, Mitchell and Co.'s New Champion Mower had many admirers. This machine is a conversion from the hay-maker's mowing machine of Otis Brothers, of New York, which attracted much attention at the Philadelphia Centennial Exhibition, and was favourably reported upon in this Journal by Mr. Coleman. Its peculiarity, says that well-known authority writing elsewhere, consists in motion being communicated to the knife through two wheels, one fixed on the axle, which revolves, and the other, fixed on a gimble joint, which has a wobbling motion, just like a cheese-plate when made to revolve. Consequently six or seven of its teeth are always in contact with the driving-wheel, which has one more tooth, and thus the motion is produced, which by

crank and connecting-rod, steadied by a sort of balanced weight, gives the necessary backward and forward motion to the knife. The motion is remarkably smooth, and friction appears reduced to the minimum. Messrs. C. Aultiman and Co., of Canton, Ohio, showed their ingenious and efficient table-rake reaper, also fully described by Mr. Coleman in his admirable report in this Journal "On the Agricultural Implements at the Philadelphia Centennial Exhibition" (second series, vol. xiii. part 1). In a good collection of reapers and mowers, shown by Messrs. Adriance, Platt and Co., of Poughkeepsie, New York, was a well-constructed new reaping machine, with simple gearing and controllable rakes driven by chain-gear. The outside wheel is fixed on the side of the frame; and by removing one rake-arm the platform can be turned up at right angles. Messrs. Osborne and Co., of Auburn, New York, had also an attractive stand, including one of their well-known binders. A large assortment of ploughs and similar implements, "nickelled" and silver-plated in no niggard fashion, gave brilliancy and effect to the American display.

Canada.—Canada sent a small but interesting collection of substantial and well-finished implements, which must have very favourably impressed foreigners, alike with the genius and enterprise of Canadian agricultural machinery manufacturers, and with the system of farming which prevails in the Dominion. There was little in the collection, however, that would greatly interest English agriculturists.

France.—The system of equally dividing real estates among children, which has reduced French holdings to such small dimensions, has tended to retard the introduction of improved agricultural machinery into the country. During recent years, however, the demand, more particularly for harvesting and threshing machinery, has increased largely, and English and American makers have long been competing keenly in the French market. As already hinted, the American machines, owing to their lighter construction, have apparently earned the larger share of favour and latterly have found, perhaps, a more extensive sale than English implements. As might be expected, France is bestirring itself to promote the home manufacture of improved machinery; and it is the opinion of not a few that at no distant day it will be self-supporting in this as in so many other respects. An English visitor to the Exhibition has thus written regarding the French display of agricultural implements:—"We were astonished at the progress shown by some of the principal firms, especially in the way of threshing machinery. It is quite true that the finish, and probably also, the quality, of the materials are not yet equal either to the best English or American patterns; but they are produced at

considerably less money, and therefore suit the pockets of the farmers, although probably less economical in the long run than better made machines." The display of the small farm implements was very large and varied; but among these we observed nothing of special interest to English agriculturists. Some well-constructed steam engines were exhibited, as also were a large number of reaping machines, the majority of the latter being made either upon the English or the American type. Modifications of Wood's reapers and mowers, with ingenious mechanism for altering the action of the rakes, seemed deservedly high in public estimation. A leading feature in the department was the display of threshing machines, many of which showed admirable arrangement and construction, and included most of the modern improvements known in England. In most cases the feeder stands on a footboard by the side of the machine, and thus supplies the grain in a direction nearly parallel with the drum. As a rule, these machines are adapted for horses as the motive-power; but on the stand of M. J. Cumming, of Orleans, Loiret, we observed a neat combination of an engine and threshing machine. The engine stands behind, on the frame above the axle, and is thus placed near to the work; an arrangement which, it is claimed, economises power and prevents any waste of time in fixing the machinery. Horse-gears are extensively employed in France, and formed a prominent feature in their department. Their construction differs greatly from English horse-gears—"the motion of the horses is transmitted to a vertical shaft, which is enclosed in a column; on the lower end of the shaft is a pinion, which engages with the second motion shaft, namely, a multiplying wheel, and on its upper end is a pulley wheel; or, if that position is objected to, then a broad wheel on the shaft engages a bevel pinion on a short horizontal shaft, on the other side of which the pulley is attached." Several hay, fruit, and other presses attracted deserved attention; as also did a machine for improving grass-land by opening its surface, shown by MM. Albarie and Co., of Laincourt, Oise. Some French firms have achieved creditable success in the manufacture of corn-screens, of which there were a large and varied assortment. Most of them exhibited good workmanship and efficiency, and were offered at from 30 to 40 per cent. less money than the cheapest screens forwarded by English makers.

Other Countries.—The collection from Russia, small as it was, showed that the agriculture of that vast and varied country has made considerable progress during recent years; and it as clearly demonstrated that Russian farmers are still to a large extent dependent on foreign countries for agricultural machinery. It is stated that there are now 205 agricultural implement

makers throughout Russia (the majority being in Poland and the central districts), employing close on 7000 workmen, and producing annually such machinery of the value of 16 million francs. Only 85 of these, however, possess foundries; few of the firms can produce steam engines; and they have hitherto not been successful in the manufacture of reapers. It would appear that threshing and dressing machines have received the larger share of attention, for in that class of machinery they have achieved on the whole satisfactory results. Threshing and winnowing machines formed the chief feature of the Russian display. Some were well made, combining English patterns; and to some good horse-gears were attached.

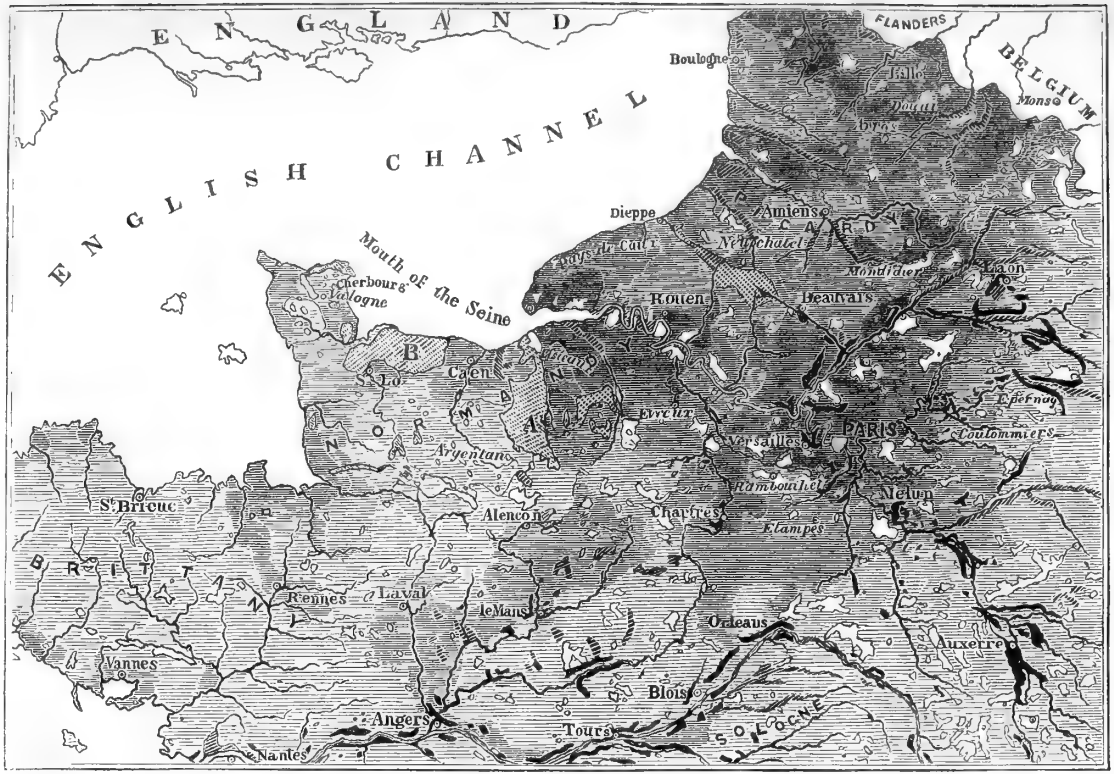
From Sweden there was a large collection of well-finished and substantial-looking ploughs, harrows, winnowers, &c. On one stand several good drills and mowers, partaking largely of American character, were to be seen. Norway was represented in the agricultural department by two firms, their collections consisting mainly of ploughs, harrows, and similar implements.

X.—*Report on the Dairy-Farming of the North-west of France.* By H. M. Jenkins, F.G.S., Secretary of the Society and Editor of the 'Journal.'

The part of France which will be treated of in this and some other reports on French Agriculture nearly coincides with that which formed the subject of Mr. Gibson-Richardson's very interesting book, entitled, most aptly, 'The Corn and Cattle-producing Districts of France.'* It is more accurately included in the portion of M. Delesse's instructive map which is engraved on p. 279. Without some such graphic representation as this map, it would be almost impossible to comprehend how small a proportion of the land of this region is really in permanent grass, in the face of the outcry that has recently arisen in England and Ireland in consequence of the influx to our markets of French butter of superior quality. It is necessary to draw particular attention to this point, because the excellence of the French product has hitherto been attributed chiefly to the alleged superiority of the pastures of Normandy, whereas most of the butter imported into England from France and some other foreign countries is made in districts where "arable-land dairying" is the rule, and "permanent grass dairying" the exception. It is not, however, pretended that every strip of grass in North-western France is represented on a map upon so small a

* Cassell, Petter and Galpin, 8vo. 1878.

Fig. 1. Agricultural Map of the North-west of France.



A. Pays d'Auge. B. Le Bessin.

scale as that on p. 279; and therefore I have calculated from official sources the actual extent of arable and grass-land in Imperial acres in the several departments of Normandy:—

Departments.	Arable.	Permanent Grass and Orchards.	Sheepwalks and Mountain Pasture.
La Manche	895,052	200,295	61,205
Calvados	769,570	242,500	15,000
Eure	947,627	83,100	27,925
Seine Inférieure	904,592	193,190	28,825
Orne	877,752	193,402	14,425

It thus appears that in the two westernmost departments of Normandy—the celebrated dairy-departments of la Manche and Calvados—much less than one-fourth of the whole cultivated land is in permanent grass of all qualities; in the Lower Seine and the Orne between one-fifth and one-sixth, and in the Eure scarcely more than one-tenth. In Brittany the permanent grass is even less extensive, but, on the other hand, the acreages of mountain pasture and sheepwalk (which were formerly included in the returns with the uncultivated land) are so large that, unless kept quite distinct from ordinary rent-paying grass-land, they would lead to an erroneous inference.

On our side of the Channel the counties placed opposite to the Norman shore have the following acreages of arable and grass land:—

Counties.	Arable.	Permanent Grass.
Cornwall	368,289	170,436
Devonshire	666,892	457,661
Somersetshire	283,735	566,356
Wiltshire	553,218	196,185
Dorsetshire	233,865	249,883

Thus in Cornwall one-third of the whole cultivated area is in permanent grass, in Devonshire the proportion is considerably more, and in Dorsetshire amounts to one-half. In Somersetshire two-thirds of the agricultural land is in permanent grass, but in Wiltshire not much more than one-fourth. Therefore, on our side of the Channel, the least grassy of our western counties has a larger proportion of its cultivated area "with verdure clad" than the most pastoral of the French departments. It should, however, be added that the deficiency of permanent grass in France is to a great extent neutralised by the extensive cultivation of lucerne, which in favourable seasons gives three

crops of green food or hay, and which in most districts can be profitably laid down for from seven to ten years.*

The importation of French butter into England is, however, a great fact, although it is not due to the superiority or the extent of French grass-land; and, what is more important still, the French product commands prices which cannot often be approached by any English butter offered for sale in large quantities on the London market, where also Irish butter is fast becoming an article of mere antiquarian interest. The following Table gives the quantities and estimated values of French cheese, butter, and eggs imported into the United Kingdom in the years 1873 to 1877 inclusive:—

IMPORTS of CHEESE, BUTTER, and EGGS into the UNITED KINGDOM from FRANCE, from the years 1873 to 1877 inclusive.

(From the English Official Statistics.)

	1873.	1874.	1875.	1876.	1877.
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
Cheese	4,819	5,487	7,741	8,744	9,614
Butter	446,550	713,251	567,560	622,488	606,762
	Gt. 100.	Gt. 100.	Gt. 100.	Gt. 100.	Gt. 100.
Eggs	4,307,468	4,494,062	4,835,103	4,187,790	3,678,166

	1873.	1874.	1875.	1876.	1877.
	£	£	£	£	£
Cheese	17,496	20,741	28,175	33,291	37,280
Butter	2,409,861	3,944,233	3,387,219	3,732,405	3,654,488
Eggs	1,952,814	2,018,725	2,078,659	1,864,135	1,602,038

* Arthur Young devotes a chapter to lucerne, and, in summing up his notes, makes the following statement:—"The culture of the plant under our consideration is one of the principal features of French husbandry. We have gone to the French school for the culture of it, yet it is ill-managed, and with bad success in England, and has been so in every period; but in France, even in climates similar to our own, it is an object of almost uniform profit; and it must therefore be unfortunate indeed if we do not extract something from the French practice deserving our attention and imitation. The first leading circumstance that demands our attention is the unvarying practice of sowing it broadcast. The lucerne in Spain, which is of a luxuriance we have no conception of, and the little I have seen in Italy, is all sown in the same way: a contrary practice, namely, that of drilling, has very generally taken place in England; it has been repeatedly urged that the humidity of our climate renders hoeing necessary to keep it free from the spontaneous grasses; and, if hoeing is necessary, drilling is certainly so. But this necessity is not found to take place in the north of France, the climate of which very nearly resembles our own. After some years those grasses destroy it there as well as here; but the French think it much more profitable when that happens to plough it up, than to insure a longer possession by perpetual expense and attention." See also the late Mr. John Clayden's note on the growth of Lucerne in the first volume of the second series of this Journal, 1865, p. 359.

The Northern and North-western departments of France are so well known to Englishmen that very little need be said about the configuration of the country, but it may be well to point out certain variations in the land of the different provinces of France included in the sketch-map on the frontispiece. The relative agricultural value of the arable land is sufficiently indicated by the gradations of horizontal shading, from the light portions, which show a mean rent to the landlord, whether occupier or otherwise, of 6*s.* per acre, to the nearly black portions, which command a rent of between 30*s.* and 50*s.* per acre, or even more, according to situation. Grass-land, vines, and woods are indicated by distinctive shadings, as is shown by the index to the map. What is known as French Flanders is, for the most part, a rich plain, exactly a counterpart in appearance, climate, culture, and people, to the region on the other side of the Belgian frontier, which has already been described by Dr. Voelcker and myself in this Journal.* Artois, Picardy, and the Pays de Caux—districts embracing part of the department of the Nord, together with the departments of the Pas de Calais, Somme, Aisne, and Oise—present the appearance of a rolling plain, chiefly possessing a rich loamy soil on chalk, with scarcely a fence or a house to be seen for miles.† The farmhouses are congregated in villages and the farms consist of innumerable strips, often very scattered, their boundaries being only discoverable by careful search for the landmark, which consists of a fair-sized and sometimes a large stone, called a "borne." Farther west the character of the country changes gradually, and in Western Normandy and Brittany, and even in the grass-land districts in the eastern portion of those provinces, hills and valleys are more pronounced, farmhouses are on the farms, and fences and trees are as abun-

* Second series, vol. vi. part 1, 1870.

† Arthur Young thus describes the soil of Normandy and Flanders:—"This noble territory includes the deep, level, and fertile plain of Flanders, and part of Artois, than which a richer soil can hardly be desired to repay the industry of mankind; two, three, and even four feet deep of moist and putrid, but friable and mellow loam, more inclining to clay than sand, on a calcareous bottom . . . Every step of the way from the very gate of Paris to near Soissons, and thence to Cambrai, with but variation of some inferior hills of small extent, is a sandy loam of an admirable texture, and commonly of considerable depth. . . . The line through Picardy is inferior, yet for the most part excellent. But all the arable part of Normandy, which is within these limits, is of the same rich friable sandy loam, to a great depth; that from Bernay to Elbœuf can scarcely be exceeded; four to five feet deep of a reddish-brown loam on chalk bottom, and without a stone. As to the pastures of the same province, we have, I believe, nothing either in England or Ireland equal to them: I hold the vale of Limerick to be inferior. The famous Pays de Beauce, which I crossed between Arpajon and Orleans, resembles the vales of Meaux and Senlis; it is not, however, in general so deep as the former. The limits I have traced are those of great fertility, but the calcareous district, and even that of chalk, is much more extensive."—'Travels in France,' vol. i., pp. 297, 298.

dant, and, indeed, as superabundant, as in some portions of the West of England. In fact, in some parts of the country the small fields are surrounded by a fence consisting of a huge raised bank, with a growth of underwood upon it, protected and guarded, as it were, by a row of closely planted trees on each side.

Another peculiarity may be seen in the apple-orchards. Cider is as much the national beverage of the Normans and Bretons as of the people of Hereford, Devon, Somerset, and the rest of the West; but the French farmer expects that his thickly planted orchard will not interfere with the growth of corn or grass. I do not propose at present to describe the "Rural Economy" of France, but it may be observed that the small farmers have a great desire to make one instrument perform two duties. The tendency is, of course, economical; and although it may be in some cases a little strained, yet in the long run, reflected as it is in the daily life of the farmer and his family, it has done much to place the small French farmer in the comfortable position in which he is frequently now seen. Many writers have been severe upon the French peasant-farmer for his economical and hoarding propensities, but I should be inclined to hold him up as a pattern of virtue, considering the extent of English improvidence, in the hope that our labourers might be induced to adopt his "providence" to some extent, and in the belief that it is not in the nature of Englishmen to pursue such self-denying practices too far.

In one respect French "providence," aided by the Continental necessity of a large standing army, has done much to check the development of the French nation, both agriculturally and commercially. All over rural France there is the same complaint—"want of hands,"—but still agricultural wages do not rise to the height one would expect in the face of so universal a dearth of labour. From 2*s.* to 2*s.* 6*d.* a day without food, and from 16*l.* to 20*l.* a year with food, besides lodging in the stable or cow-house, are the prices usually paid for agricultural labour in the north of France, except where the immediate neighbourhood of a large town or an extensive manufactory exerts a distinct influence on the labour-market.

The wages just mentioned do not include, it need scarcely be stated, the earnings of the maker of the cheese or butter on a dairy farm; but it is generally the case that the farmer's wife or daughter performs this very important duty. The French law of succession to property—which limits almost to vanishing point the power of the father of the family to devise his property otherwise than in equal shares to his children—whatever its bad effects may be, produces one undeniably good result amongst

the small farmers, as it makes the two or three children, who constitute a large family in France, work together for the common benefit. To this fact must in some degree be ascribed the success of the French farmers in producing butter, and especially soft kinds of cheese, of delicate flavour, and therefore possessing a high market-value. Under no other circumstances, probably, would so much care be bestowed on the making, and such constant supervision in the curing, to say nothing of the delicacy in packing, of these highly susceptible and easily perishable articles of commerce.

After I have described, in the reports which I propose to write on French agriculture, the results of the national system of laws and customs on the cultivation of the soil, and upon the owner, occupier, and labourer, it may be useful to endeavour to connect causes and effects, and to contrast the merits of the French system with those of our own. At present, however, it appears to me more profitable to confine myself to a simple description of the facts relating to dairy-farming as I have gathered them, especially as the improvement of our butter, and of our dairy-products generally, has become one of the most pressing agricultural questions of the day.

Cattle.

The breed of cattle seen almost universally in the North-west of France is the Norman in its several varieties, the purest and best of which is known as the Cotentin. In colour these cattle are generally brown, red, or brindled interwoven with white, and with a tendency to a white face, which, without being characteristic, is often observed. They have the distinctive characters of a good milking breed, but are somewhat large-boned and thick-skinned. The size of the animals varies very much with the physical features and the fertility of the country, and the more or less advanced state of its agriculture. In the more hilly districts, and also on the elevated plains of arable land, where the farms are small and the food of the cows poor in quality and not over abundant in quantity, the cows are small and do not fetch more than from 10*l.* to 15*l.* each. But in the rich grass-land districts of the Pays d'Auge and the Bessin the cows are worth from 20*l.* to 25*l.* each, and on the average give that sum as an annual return in butter and offal from a yield of 500 to 600 gallons of milk, while the best makers of the celebrated Camembert cheese can show a gross return of an additional 50 per cent. on the higher figure.

Considering the value of the milk and its products, it is not to be wondered at that the ordinary farmer shrinks from the

experiment of crossing his breed with the Shorthorn. Tradition, which is more remembered than history, tells him that the Shorthorn is a gluttonous fat-making machine, suitable only to produce gross meat for the English market, at a great expenditure in artificial food. Official reporters, like M. Lefebvre de Sainte Marie, Inspector-General of Agriculture, and winners of the Government Prizes of Honour, may give a different version of their experience, but they have hitherto had little or no effect upon the ordinary farmer. Many of the large proprietors, and some even of the larger farmers, use a Norman-Shorthorn bull, and frequently one sees cows which, in the shape of their horns, the colour of their nose, and an approach to squareness of form, give the idea that a little infusion of Shorthorn blood runs in their veins.

On farms where Camembert and other soft cheeses are made, it is preferred to have the calves drop in September, as between that date and the end of April the best prices are made for such descriptions of cheese, all of which are more or less difficult to transport in the middle of summer. On butter-making farms, on the other hand, spring-born calves are preferred, April being the favourite month. French butter is at its worst in the winter, especially in the grass-land districts, while Camembert cheese is then at its best. The calves on dairy farms are not allowed to suck their dams, but they get for the first few days a fair allowance of the milk, if it is intended to rear them; and afterwards they are brought up chiefly on skim-milk, which has been gradually more and more denuded of cream. With the exception of bran, additional food is rarely given. In some districts the calves are not only reared, but are fattened for the Paris market on a forcing system, so that, owing to the high price of veal in Paris and the cheapness of lean cows in the country, a well-fattened calf of three to four months old is not unfrequently worth nearly as much as a lean old cow. The price of fat calves varies from 6*d.* to 9*d.* per lb., live-weight, according to the season, so that a fat calf weighing 1½ cwt. would be worth from four to six guineas.

With regard to the summer-fattening of oxen on the pastures of Normandy at the present day I cannot do better than give the following translated extract from M. de Sainte Marie's notice of the Department of Calvados * :—

> The best pastures are those which rest on a somewhat light soil, which is not wanting, however, in tenacity. Then the grass is bushy, tender, and nutritive, and the vegetation is always active if the soil is fertile. Prolonged droughts need not then be feared, since the more fertile the soil, the more it

* 'Les Primes d'Honneur, &c., décernés dans les Concours Régionaux en 1867.'

is charged with humus; and the better it is covered with a thick vegetation, the longer will it retain its freshness. If, on the contrary, the soil is very tenacious, although rich in vegetable matter, the water will remain on its surface for several months; then again it hardens and cracks during the summer, the grass becomes tough, and it fattens the cattle slowly and imperfectly. The pastures upon the Dive clay in the valley of Auge and upon the Liassic clay in the Bessin are the most productive.

The beautiful valley of Auge is divided into several secondary valleys, known as the valleys of Livarot, of St. Julien, of Crèvecœur, of Corbon, of Lisieux, of Pont l'Evêque, &c. In these valleys of Lower Normandy, two kinds of oxen are fed every year; namely, those of the district (Norman breed), and those brought from other departments of France.

Towards the end of the winter or the beginning of spring, a little earlier or a little later, according as vegetation is more or less forward, the graziers and cattle-dealers frequent the lean-cattle fairs. The earliest-bought oxen frequently arrive before the pastures are sufficiently furnished with grass; they are then, if necessary, fed with hay, care being taken to gradually diminish the quantity given them as the pastures come on. Generally, grass feeding is in full operation in the month of May, the purchases having arrived somewhat as follows:—In March, the oxen bought at the fairs in the departments of la Manche, la Mayenne, la Sarthe, l'Orne, Ille-et-Vilaine, and Calvados; in April those purchased in the districts of Avranchin, Perche, Brittany, Anjou, and the Department of Mayenne; in May further purchases from these same districts and from Poitou. The best feeding beasts come from la Manche, Calvados, Orne, and Mayenne, districts where the Shorthorn is often crossed with the native breeds. The oxen which fatten the most slowly are those which have been bought in the Loire-Inférieure, the Deux-Sèvres, and the Indre et Loire.

The following is the usual order of proceeding in grazing beasts in Normandy:—

From the 15th of October to the 1st of December, according to the nature of the soil and the abundance of grass, the oxen which have been bought lean at the autumn fairs of la Manche, Calvados, and Orne, are put on the pastures where they will pass the winter. These oxen find a sufficient quantity of food in the fields; but, nevertheless, when the weather is bad and the land is frozen, each ox is given two "bottes" of hay per day. The hay is placed in a rack attached at the back to the end of the stable, and having a roof forming a pent-house, or in a wooden cage, or a kind of crate. In this latter case, the worst parts of the pasture are chosen, and the position of the cage is changed when the land has been much trampled if the weather is very wet. No matter what the weather, the beasts are never put under cover.

The number of oxen that can be wintered on the land varies very much; but it is rare that more than one-fifth of those that can be fattened during the year can be kept. There is, however, the certainty that the grass is sufficient to support them but not to fatten them. In the spring, after the temperature has risen so that vegetation becomes active under its influence, the grass soon grows and the oxen begin to fatten. These winter-kept cattle can thus be sold generally towards the end of May and in June, and they are nearly always heavier than summer-fed beasts.

From the middle of April to the middle of May, when vegetation is fully active, and the winter-kept cattle are tolerably well advanced, and when the grass begins to gain upon them, the total number of cattle which the land will carry is bought in, generally from 6 to 20 oxen, for each farm, according to the extent and the quality of the pastures, and the probability of a good crop of grass. If the year should turn out favourable, these animals are sold from the middle of September to the middle of October.

Sometimes, in proportion as the winter-kept cattle are sold off, they are replaced by an equivalent number of beasts, bought later than the spring purchases, if the grass will carry them; but generally the summer-fed beasts consist only of those bought in during April and May. Those, however, which can be sold in September are always replaced by others, which are sold before the cold weather sets in, especially if they were in good condition when they were put on the pastures.

It is calculated that it requires, on the average, to fatten a bullock, the following quantities of land:—

First quality grass, large bullock, seven-eighths of an acre.
Second quality grass, medium bullock, 1 acre.
Third quality grass, small bullock, seven-eighths of an acre.

It has also been estimated that a medium-sized bullock consumes during its fattening period a quantity of grass equivalent to three tons of hay.

The greater part of the pastures fatten also a number of Norman sheep every year. In some localities they are bought in at Michaelmas and in others towards All Saints' Day. They are sold during the winter or at the commencement of spring, but always before the first of April. The advantage of this practice is that the sheep eat with avidity the grass which has grown under the stimulating influence of the cattle manure. The tufts of grass thus produced are always rejected by the bullocks, while the sheep, on the contrary, browse the pieces of grass which would be completely lost unless utilised in this way.

The beasts which are beginning to be fit for the butcher become more and more difficult to feed, and they frequently refuse to graze land which is shaded by trees as well as that which has grown vigorously where their excrements have dropped. It is therefore found necessary to put up such fields to be mown for hay.

In confirmation of this statement, which English graziers will not regard as indicating a very advanced condition of "Pastoral Husbandry," it may be interesting to quote a portion of Arthur Young's description of the cattle-feeding and cow-keeping of this very rich grass-land district ('Travels in France,' vol. ii., pp. 48–50). It will be seen that, although prices and profits have altered, practices have remained the same as they were a hundred years ago:—

Normandie—Neuchâtel.—There are dairies here that rise to fifty cows, the produce of which in money, on an average, rejecting a few of the worst, is 80 to 100 liv. (3*l.* 10*s.* to 4*l.* 7*s.* 6*d.*), including calves, pigs, butter and cheese. In winter they feed them with straw; later with hay; and even with oats and bran; but not the least idea of any green winter food. The vale from hence to Gournay is all full of dairies, and some also to Dieppe. One acre of good grass feeds a cow through the summer.

To Rouen.—Good cows give 3 gallons of milk a day; they are of the Alderney or Norman breed, but larger than such as come commonly to England.

Pont au Demer.—Many very fine grass enclosures of a better countenance than any I have seen in France, without watering; grazed by good Norman cows, larger than our Alderneys, but of the same breed: I saw thirty-two in one field. In the height of the season they are always milked three times a day; good ones give three English gallons of milk a day. A man near the town that has got cows, but wants pasture, pays 10 sous (about 5*d.*) a day for the pasturage of one, which is a very high rate for cattle of this size.

Pont l'Evêque.—This town is situated in the famous Pays d'Auge, which is the district of the richest pasturage in Normandy, and indeed of all France,

and for what I know, of all Europe. It is a vale of about thirty-five miles long, and from half a mile to two miles over, being a flat tract of exceedingly rich land, at the bottom of two slopes of hills, which are either woods, arable, or poor land; but in some places the pasture rises partly up the hills. I viewed some of these rich pastures, with a gentleman of Pont l'Evêque, Mons. Reval, who was so good as to explain some of the circumstances that relate to them. About this place they are all grazed by fatting oxen: the system is nearly that of many of our English counties. In March or April, the graziers go to the fairs of Poitou, and buy the oxen lean at about 240 liv. (10*l.* 10*s.*); they are generally cream-coloured; horns of a middle length, with the tips black; the ends of their tails black; and tan-coloured about the eyes, which are the distinctions about the Poitou breed. At Michaelmas they are fat, and sent to the fair at Poissy, that is Paris: such as are brought in at 240 liv. lean, are sold fat at 350 to 400 liv. (15*l.* 6*s.* 3*d.* to 17*l.* 10*s.*). An acre of good pasturage carries more than one of these beasts in summer, besides winter fattening sheep. This acre is 4 vergés, each 40 perches, and the perch 22 feet, or a very little better than 2 English acres. The rent of the best of these pastures (called *herbages* here) amounts to 100 liv. (4*l.* 7*s.* 6*d.*) per Norman acre, or nearly 2*l.* 3*s.* 9*d.* the English; the tenant's taxes add 14 liv. (12*s.* 3*d.*), or 6*s.* 1½*d.* per English acre. The expenses may be stated thus:—

	Livres.		Value in English Money, according to Arthur Young's Table. £	s.	d.
Rent	100	..	4	7	6
Taxes	14	..	0	12	3
Suppose 1½ ox fattened, bought at 240 livres	360	..	15	15	0
	474	..	20	14	9
Interest of that total	23	..	1	0	1½
Total	497	..	21	14	10½
Say	500	..	21	17	6
Ox and a-half fat, at 375 livres	562	..	24	11	9
Expenses	500	..	21	17	6
Profit	62	..	2	14	3

Which is about 1*l.* 6*s.* 6*d.* per English acre profit; and will pay a man well, the interest of his capital being already paid. As these Norman graziers are generally rich, I do not apprehend the annual benefit is less. In pieces that are tolerably large, a stock proportioned to the size is turned in, and not changed till they are taken out fat. These Poitou oxen are for the richest pastures; for land of an inferior quality, they buy beasts from Anjou, Maine and Bretagne. The sheep fed in the winter do not belong to the graziers, but are joisted; there is none with longer wool than 5 inches, but the pasture is equal to the finest of Lincoln. In walking over one of these noble herbages, my conductor made me observe the quantity of clover in it, as a proof of its richness; it was the white Dutch and the common red: it is often thus—the value of a pasture depends more on the *diadelphia* than on the *triandria* family.

To Lisieux.—This rich vale of the Pays d'Auge some years ago was fed almost entirely with cows, but now it is very generally under oxen, who are found to pay better. Whatever cows there are, are milked three times a day in summer.

To Caen.—The valley of Corbon is a part of the Pays d'Auge, and said to be the richest of the whole. In this part, 1 acre of 160 perches of 24 feet, or

about (not exactly) 2¼ acres English, fattens two oxen. Such rents are known as 200 liv. (3*l.* 17*s.* per English acre), but they are extraordinary: the proportions here are rather greater, and more profitable than in the former minute. They buy some beasts before Christmas, which they keep on the pasturage alone, except in deep snows; these are forwarder in spring than such as are bought then, and fatten quicker; they have also a few sheep. There are graziers here that are landlords of 10,000 liv. (437*l.* 10*s.*), and even 20,000 liv. (875*l.*) a year, yet 100 acres are a large farm.

Bayeux.—The rich herbages about this place are employed in fattening oxen of the Poitou breed, as before; bought lean, on an average, at 200 liv. (8*l.* 15*s.*), and sold fat at 350 liv. (15*l.* 6*s.* 3*d.*). Their cows are always milked thrice a day in summer; the best give 12 pots a day, or above 4 galls., and sell at 7 or 8 louis (6*l.* 2*s.* 6*d.* to 7*l.*) each.

Isigny to Carentan.—Much salt marsh, and very rich; they fat oxen; but I was surprised to find many dairy-cows also on these very rich lands. A cow, they say, sometimes pays 10 louis in a year; giving 8 lb. of butter a week, at 20 sous to 30 sous (10½*d.* to 15¾*d.*) a pound at some seasons, but now (August 25) only 10 sous, which they say is ruinously cheap. All are milked thrice a day. Others informed me that a cow gives 10 lb. a week, at the average price of 15 sous (nearly 8*d.*). These cows resemble the Suffolk breed in size and brindle colour, round carcass and short leg; and would not be known from them but by the horns, which are of the short Alderney sort. The profit on fattening a cow here they reckon at 72 liv. (3*l.* 3*s.*), and an ox of the largest size 300 liv. (13*l.* 2*s.* 6*d.*). They have also a common calculation that dairy cows feed at the expense of 8 sous (4*d.*) a day, and yield 20 sous (10½*d.*), leaving 12 sous (more than 6*d.*) profit. It is remarkable, and cannot be too much condemned, that there are no dairies in this country; the milk is set and the butter made in any common room of a house or cottage.

Carentan.—Many oxen are bought at Michaelmas, and kept a year. They eat each in the winter 300 bottes of hay, or 50 liv., but leave 150 liv. (6*l.* 11*s.* 3*d.*) profit, that is, they rise from 300 liv. (13*l.* 2*s.* 6*d.*) to 450 liv. (19*l.* 13*s.* 9*d.*). Cows pay, on an average, 100 liv. (4*l.* 7*s.* 6*d.*), and are kept each on a vergé of grass, the rent of which is from 30 liv. (1*l.* 6*s.* 3*d.*), to 40 liv. (1*l.* 14*s.*). As the vergé is 40 perches of 24 feet, or 23,040 feet, it is equal to 96 English square perches, which space pays 100 liv., or per English acre, 7*l.* 5*s.* 3*d.*; but all expenses are to be deducted, including what the wintering costs. Here they have milk-rooms. They work oxen all the way from Bayeux in yokes and bows, like the old English ones, only single instead of double.

Advancing, cows sell so high as 10 and 12 louis (8*l.* 15*s.* to 10*l.* 10*s.*). Many are milked only twice a day; good ones give 1¼ lb. or 1½ lb. of butter a day. They remark that cows that give the largest quantity of milk do not yield the largest quantity of butter. Fat cows give much richer milk than others.

Again; a good cow gives 6 pots of milk a day, which pays in butter 24 sous (over 1*s.*). 3000 liv. (131*l.* 5*s.*) profit has been made by fatting thirty cows. A great number of young cattle all over the country, especially year-olds.

As an appendix to the foregoing very interesting extract, written at the end of the last century, it may be useful to state that several years ago the farmers of the beautiful pasture-land around Livarot objected to dairy-cows, because they poached the land so much in winter; whereas feeding-beasts, being on the land during the summer months only, did little or no damage. The Count de Neuville told me that he had great difficulty with his tenants on this score, although dairy-cows have of late years paid

so much better than feeding beasts, until he hit upon a means of economically manuring the land. His estate near Livarot lies for some distance along the course of a river, which in winter is charged with a large quantity of mud brought down from higher ground. This river he tapped at its highest point on his estate, and besides using some of its muddy water for winter irrigation, he conducted a portion of it along a canal to a reservoir, where it formed a lake and deposited the suspended material, the effluent water being comparatively clear. In the spring this sediment was spread over the land, enormously increasing its productiveness, and rendering it much less tender. Livarot is now in the heart of the principal Camembert district, besides having a special skim-cheese called by its own name.

In the treatment of dairy-cows, the farmers of each district pursue the same method; but there is the greatest possible contrast between the practices of the grass-land and the arable dairy districts. In the best district for Camembert cheese (Pays d'Auge) and in the butter district of Isigny (le Bessin), the cows are always kept on the pastures, except for a short time before and after calving. On the other hand, in the arable regions of Eastern Brittany and in the neighbourhood of Paris, cows are kept in the sheds all the year round, except for a short time in the morning and afternoon in summer. Again, the food is nearly always the natural produce of the soil, the substances generally known as "artificial" foods being seldom used in France for dairy-cattle. Bran, however, is largely used in the arable districts, where also the whole of the natural grass and a large proportion of the lucerne are always reserved for hay.

M. Paynel has a farm of about 500 acres, close to the station of Mesnil Mauger, near Lisieux, in the Pays d'Auge. It is all in grass, and the rent averages three guineas an acre. He keeps 80 cows, and feeds annually about 120 beasts. The cows are never in the stables except at calving-time; but from the first appearance of frost to the end of the cold weather they get hay in the fields. The hay is given in boxes divided into partitions, to ensure as far as possible that each cow gets its fair share. The whole of the grass-land is fed more or less until May, when about one-third of it (taken in rotation) is reserved for hay. The feeding-beasts are bought in April or May and sold the following August or September, being generally five- or six-year-old Norman bullocks.

Considerable attention is paid to the rolling of grass-land in this district, and M. Paynel uses a roller of his own construction, namely, a cart with the roller in place of wheels. In this manner he has solved his previous difficulty of regulating the weight of the roller.

In the Isigny district a similar procedure is followed, and one hectare (2½ acres) is at least sufficient to keep a cow all the year round, the rent obtained being about 4*l.* 16*s.* per acre. Within a mile of this town is a farm where some of the best Isigny butter is made. It consists of 125 acres, of which one-half is annually pastured, 50 acres are mown annually in rotation and the aftermath fed by cows, and there are 12½ acres of ploughed land used to grow carrots, beetroots, and a small quantity of white crop chiefly for the straw. There are 50 Norman cows, whose average annual yield per head is 2 cwt. of butter, which is sent to Paris, and for which the farmer (an unmarried lady) receives from 2*s.* to 2*s.* 3*d.* per English pound (5 fr. 50 c. to 6 fr. 30 c. per kilo.). In round numbers this represents a gross annual return of 22*l.* to 25*l.* per cow from butter alone, to which must be added the value of the calf (generally sold fat to the butcher at three months old), and of the skim-milk and butter-milk, with which a large number of pigs and calves are annually fattened. On this farm, the cows are never put in the houses except for two or three weeks before calving, and a couple of months afterwards. In very bad winters they may be sent into the houses for the night; but as a rule there is a shed in the fields into which they may go for shelter.

In contrast to these Norman practices, I may place the system pursued in Eastern Brittany, near Rennes,—the district where the celebrated butter of la Prevalaye is made. The farm-school of Trois Croix, close to Rennes, is a good example of this style of farming. It consists of 225 acres, rented at 54*s.* per acre. The rent is high for this part of France; but M. Bodin, the tenant, has the advantage of close proximity to the town, where his milk is sold, and whence he obtains the *vidange* from the garrison of between 800 and 900 men. There are no less than 70 cows kept, as well as 10 working oxen and 10 horses. The cows are kept in the stalls all the year round, and are fed in winter upon chopped hay and straw, which are mixed with pulped mangolds and allowed to ferment. In the summer the cows are soiled on different kinds of green-food. All the young cattle are reared, as they are a cross between the Norman and the Shorthorn, and sell for half as much again as the cattle of the country. This is no great price, however, as near Rennes from 12*l.* to 13*l.* is thought to be a good price for a cow. M. Bodin finds that the Shorthorn cross gives size and adaptability to fatten, while it does not decrease the yield of milk. But this yield is generally small in the Rennes district, as compared with that of the best Norman cattle, and probably does not average more than 350 gallons.

The rotation of crops pursued on this farm is a six-course

shift, namely (1) roots, chiefly mangolds; (2) barley; (3) clover; (4) wheat; (5) rape-seed; (6) wheat. In favourable seasons, the rape-seed would be gathered in about the middle of June, and a catch-crop of buck-wheat taken afterwards on part of the course. Again, part of the root-course is cropped with maize, which is drilled in May, after the land has been prepared by cultivation and manuring as for mangolds. On September 6th, when I saw it, the plants averaged from 9 to 10 feet in height, and the crop was being cut green as required to be given to the cows in the stalls. The amount of fodder per acre yielded by this crop of maize must have been enormous; and as regards its feeding properties, although there are differences of opinion as to whether it has most effect upon the quantity or the quality of the milk, it is universally admitted to be an excellent food for all kinds of cattle.

M. Bodin's land had for the most part been drained, and the state of cultivation of the stubbles, the growing crops of maize and mangolds, and the condition of the pastures, all showed what the land is capable of. This farm is worth seeing in the midst of a district which looks a complete picture of neglect, the stubbles being rank with weeds, the pastures reedy, and the stacks unthatched, often built round a growing tree. The average rent of land is about 30*s.* per acre, chiefly in consequence of the large proportionate return from the apple-orchards, which extend over nearly the whole acreage of the farms. A curious contrast to everything else in the neighbourhood was the well-made, firmly consolidated, square-trimmed manure-heaps, which stood in front of even the meanest and dirtiest little farm-house.

An intermediate practice is to be found in some districts, where lucerne is pastured during the summer by dairy-cows, which are tethered or folded. In the latter case, the cows are placed at night in a small fold near the homestead, and not unfrequently the hind sleeps in a movable hut placed close to the fold.

As an example of this system, I may quote the farm of Bailleux, near Longeons, Oise, rented by M. Ancelin. It consists of 575 acres of rather strong land, situated on an elevated plain. The rent is about 32*s.* per acre, and the expense of cultivation comes to a similar amount. There are 25 acres of old grass; and an additional 75 acres, laid down by the tenant within the last few years, had a very promising appearance last autumn. About 100 milch-cows are kept, between 20 and 30 of the most unprofitable ones being fed off every year on the pasture-land, stall-feeding being unknown. The other live stock consists of a breeding flock of 250 ewes (Merino and Leicester cross), the lambs being sold in the wool at from 3 to

4 months old, and about 200 fatting sheep bought and sold annually. In the summer the cattle are tethered on grass or lucerne, and in the winter they get carrots and beetroot, pulped and mixed with cut straw and lucerne-hay to ferment, as well as bran or about 2 lbs. of linseed cake each per day. This somewhat extravagant feeding, for a French farm, is divided into five meals, and it is stated that the cows give an average of more than two gallons of milk per head per diem, which would make a total of at least 600 gallons per head per annum, supposing them to be in milk ten months in the year. The cows are of the ordinary Norman breed, but they seemed to me to have more hair and a more robust appearance than other herds I had seen. M. Ancelin buys between 40 and 50 tons of bran every year, using it for the cows in winter, for rearing calves, and for his horses. The cows are tethered night and day in the summer, and the herdsman sleeps in a small hut on wheels close to the line of cows. Considering the quality of his land, which is indicated by its rent, I have no doubt that M. Ancelin finds his expenditure on artificial food a profitable investment, as may be inferred by the yield of milk just stated. I should add that the National Jury awarded a large gold medal to M. Ancelin at the Prize Farm competition in his Department in 1869.

Sale of Milk to Paris.

At first sight it would appear that the supply of milk to Paris, estimated at about 70,000 gallons per day, or considerably more than one-half that of London, must necessarily be conducted on principles similar to those which govern the milk-trade of our own metropolis; but in point of fact there are, so far as I know, very few examples in England of such establishments as are the rule in and around Paris.

Two systems are in vogue in Paris, namely, the sale of milk by large dairy-farmers direct to the rich consumer; and the ordinary wholesale milk-trade, which involves collection and preparation by the merchant, sale to dealers, and distribution by them to the ordinary consumer.

As an example of the former system I may quote the farm of Mons. Emile Tétard, at Gonesse, a few miles from Paris. His brother, who is a farmer and a sugar-maker, also lives in that commune, and the two are partners in a double set of steam-ploughing tackle. The dairy-farmer occupies 750 acres of arable land, which he cultivates on the usual French three-course shift, namely (1) winter corn, (2) spring corn, (3) artificial grasses and beetroots, with a separate portion of the land in lucerne, which remains a number of years, and, as usual in the

arable districts, takes the place of permanent grass. M. Tétard keeps about 60 cows, sometimes more and sometimes fewer; he buys them in Normandy through the medium of commission agents, and aims to get them about three or four weeks after they have calved, selling them at the best price he can get when they begin to run dry. The loss on the cows which this system entails is not so great as would at first sight appear, in consequence of the number of sugar-makers and distillers, who want cattle of some kind or other to consume the beetroot-pulp, and other residue of their factories. The cows are fed on hay and straw, mixed with beetroot-pulp, and bran is added as an auxiliary.

The distinctive feature of the system lies in the distribution of the milk to the consumer. The milk as it comes from the cow having been cooled to about 55°, by immersing the cans containing it in a bath of cold water, fed by means of an artesian well, it is transferred to small vessels of tin or porcelain, containing either one litre or half a litre each. These vessels are immediately sealed by means of a piece of lead passed through a staple, in front of a hasp; the lead being then pressed flat by a pair of pincers carrying the seal of the dairy, the little vessel cannot be opened without destroying this impression. Purchasers thus have the security of receiving the milk as it leaves the dairy; and it appears that in Paris they are quite willing to pay for this guarantee of quality, the prices of some of the leading dairies being 70 centimes per litre, or 40 to 50 centimes the half-litre, delivered to the house.* Some dairies charge a little less for the milk delivered in tin vessels than for that sent in porcelain, and others again charge a little higher price to occasional purchasers, the tariff quoted being for regular subscribers. The empty vessel is given up when another full one is delivered.

The careful cleansing of such a large number of vessels as this system must necessarily entail is a most important element in its success, and one the cost of which must be reckoned as paid for in the high price received for the milk. M. Tétard employs for this purpose a machine which is simply a series of rŏtating brushes of various sizes, according to the size of the vessel for which it will be used. This machine is made by M. Rouffet, aîné, Rue St. Ambroise, Popincourt, Paris, and nothing can be more simple than its construction. On one side of a vertical plate is a series of cog-wheels, all or any of which can be put in or out of

* A litre being a pint and three-quarters, this price amounts to nearly 8*d.* per quart, or more than half-a-crown per gallon. This is 50 per cent. above the price of milk to the West-End consumer.

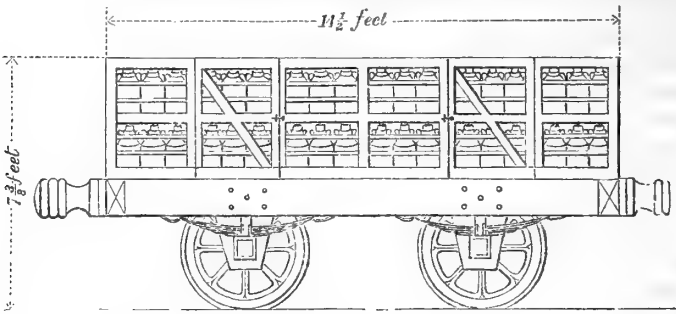
gear. The axles of these wheels are prolonged on the other side of the plate, and are fitted to carry the rotatory brushes. Above is a series of taps to regulate the supply of hot and cold water, for all these brushes are intended to cleanse the inside of the vessels. At the end of the machine are some more brushes, working at right angles to the rest, and used to polish the outside of the vessels, therefore they are worked dry and supplied with a polishing material.

As a favourable example of the ordinary system I will take two of the establishments of Mons. Lecomte, President of the Association of Wholesale Dairymen, to whom I am most deeply indebted for the ready and kind manner in which he devoted his valuable time to facilitate my inquiries. M. Lecomte has several establishments, but it will only be necessary to refer to the two which I visited with him. He sells milk wholesale to the value of 40,000*l.* per annum, makes on the average half a ton of Gruyère cheese per day, feeds and fattens between 400 and 500 pigs per annum, and keeps about 70 horses for the sole purpose of collecting milk from the farmers, of whom he purchases. He buys from each farmer as much or as little milk as each one chooses to sell, probably not more than a gallon or two of one, 30 or 40 gallons of another, and so on. The milk is put into his own cans, holding 20 litres, or a little more than 4 gallons each. As these milk-cans are universally used in the north of France for the conveyance of milk long distances, I have thought it desirable to give a sketch of one of them (Fig. 2), as well as of the two-storied railway-waggon (Fig. 3, p. 296) in which they are stowed. It is claimed for these cans that their shape, more especially their shoulder, retards the rising of the cream longer than any other form of can. For use in the summer months, M. Lecomte has these cans made with a double case, the space between the inner and outer case being stuffed with wool. I should add that the cans are made and repaired by M. Lecomte's own people at his Montereau establishment.

Fig. 2. — *Milk-can used for conveying Milk long distances by road or rail.*

The morning's milk is brought in by M. Lecomte's collectors between 8 and 10 o'clock, and is immediately scalded by placing the cans containing it in a hot-water bath having a temperature nearly approaching the boiling-point. It is afterwards cooled by the cans being immersed in a bath of cold water, fed either by a running stream — as at his Melun establish-

Fig. 3.—*Railway-van, loaded with two tiers of Milk-cans.*



ment—or by water pumped from a deep well, as at Villeneuve-la-Guyard, near Montereau. The evening's milk is delivered between 5 and 7 o'clock, is cooled and mixed with the morning's milk, and the whole arrives in Paris early the next morning. It is said that this mixture has a slightly nutty flavour, which causes it to be preferred to ordinary new milk.

At M. Lecomte's establishment near Melun, there is one of M. Raoul-Pictet's freezing-machines, which enables him to reduce rapidly to freezing-point a large quantity of milk every evening. The remainder of the mixture of morning's and evening's milk that cannot be refrigerated is placed in cans in a bath fed by a running stream, which keeps it at about 50° Fahr. Before the milk is sent out, the two lots are mixed together, and the whole is thus reduced to about 45° Fahr. The cost of the freezing-machine, including steam engine, pump, aspirator, tanks, and everything complete, was between 1600*l.* and 1700*l.*

The retail price of milk in Paris varies with the season, but is generally about 14*d.* per gallon. When the lucerne gets frost-bitten the price rises suddenly to the winter level, because the cows must then be put upon their winter diet and therefore give less milk; while, on the other hand, it appears that more milk is consumed in Paris in cold weather than in the summer, when fruit enters so largely into the dietary of the French people. A wholesale and even a retail milk-merchant must therefore have some outlet for his surplus stock, and many retail milkmen make butter or a special kind of cheese with it. M. Lecomte has, at Villeneuve-la-Guyard, a large Norman churn, with which he makes butter on the Isigny plan (see p. 298). It is worked by a two-horse Tangye's engine, the churn being set to sixty revolutions per minute. Butter is only made when he considers that it will pay better than Gruyère cheese, of which he can make at that establishment 20 every day.

Butter-making.

In France, as elsewhere, several distinct methods of butter-making exist in the different parts of the country, and it might interest the curious in such matters if I described each of them in detail. From the primitive method of shaking cream in a wide-mouthed bottle, which I saw in the Médoc, to the most refined method pursued in the best districts of Normandy, there is almost every gradation. But, for practical purposes, it will be sufficient to describe the types of manufacture by which are made the Normandy and the Brittany butters which come into our markets and realize higher prices than the English product.

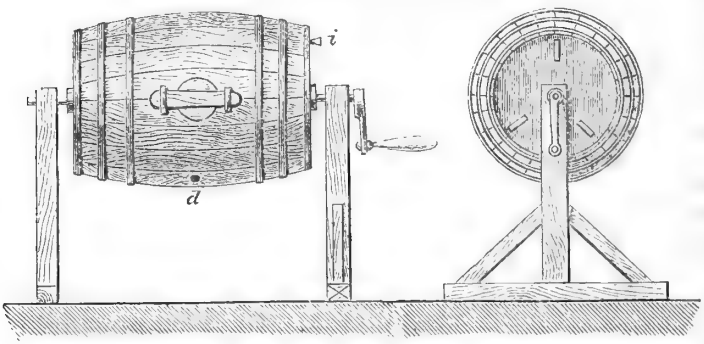
It would be idle to deny that several factors enter into the production of good butter. As a rule, dairy-farmers believe that the actual process of butter-making has little or nothing to do with it; but all admit that the most scrupulous cleanliness is absolutely essential. The bad quality which is too often characteristic of English and Irish butter is ascribed to various causes:—to the wet season having produced bad food, to bad ventilation, bad water, a thunderstorm, and all sorts of causes, preventible and non-preventible, to the exclusion of what is, in my judgment, the general cause, namely, inattention to the true principles of butter-making. No doubt, bad or unsuitable food will taint the milk, and that milk will produce rank butter, and the other reasons usually given will generally have the effect ascribed to them. But, after all, why is it that so much bad butter is made where and when none of these unfavourable conditions exist? I have heard landowners complain that they cannot get good butter, such as they get in a Parisian hotel, made at their home dairy, where economy and profit are secondary considerations; and I have even heard farmers declare this year (1878) that one of the attractions of Paris, which they discovered by going to see the Exhibition, was the delicious French butter! Individually, I should not place French butter so high as Danish for keeping purposes, but as fresh butter, especially in summer, it has a delicate and slightly nutty flavour which almost every one appreciates, although experts judging of it as an article of commerce would sometimes pronounce it "weak." The main point for the farmer is that the best French butter makes a very high price, and that a slight difference in the process of manufacture sensibly affects its market value.

Isigny Method.—In the Bessin district of Normandy, where the premier French butter (known as Isigny butter) is made, the process is as follows:—In this district the cows are milked morning and evening, and in some cases three times a day, into jug-shaped vessels, made of copper lined with tin, and holding

about two gallons each. The milk is taken to the dairy, and that from the several cows being more or less mixed together, it is strained through a sieve lined with clean linen into earthenware buckets. These buckets are placed in a row in the milk-house, generally on a course or two of brickwork raised above the general level of the floor, and the milk is then set for 12 hours. The cream skimmed after the first 12 hours is not mixed with what is taken off afterwards until immediately before churning, and in some instances butter of exceptional delicacy for Paris is made entirely from the 12-hours' cream. Some farmers let the milk stand 24 hours in summer and 48 in winter, and others even longer still, but it is almost needless to add that they do not get the best price for their butter. Nor does the increase in quantity which they obtain compensate them for lack of quality.

The cream is churned twice or three times a week in a barrel-churn. Generally, the true Norman barrel-churn (Fig. 4) is used.

Fig. 4.—*The Norman Barrel-churn.*



ELEVATION. END-VIEW.

d. Spigot. *i*. Ventilation Peg. (The head being removed.)

It has fixed dashboards, and, as will be seen by the engraving, they do not extend to the circumference of the churn. Thus the only corners where butter or butter-milk could lodge are the very small ones at each end of the dashboards. The dash-boards are perfectly plain laths, and the churn altogether is a model of simplicity and effectiveness, completely illustrating the truth of the conclusion arrived at by the Judges of Dairy Appliances at Bristol—"that numerous and large dashers are a mistake" (see p. 146). According to the size of the churn it is furnished with one or two large openings, which are opened and shut by one of the usual contrivances employed in other barrel-churns. There is also a vent-peg placed in or near the

head, and intended to be used as a ventilator if necessary, and a spigot placed in the bulge midway between the two large openings of a large churn, or opposite the large opening of a small one. This spigot plays an important part in the process of butter-making.

The churn is about half-filled with cream at a temperature, more frequently guessed at than tested, of about 57° Fahr., and the best butter-makers do not churn at a greater pace than from 30 to 40 revolutions per minute, according to the season.* As a rule, the butter comes in from 20 to 30 minutes, and the churner listens most attentively so as to detect in an instant the slightest alteration in the sound of the churning cream. An alteration being detected, or even being thought to be detected, the churn is at once stopped, in such a position that the spigot is at about the level of the cream in the churn. The spigot is then carefully withdrawn, and the adherent matter minutely examined. If this is still cream the churning is renewed and the sound carefully attended to; but if, on the contrary, there are particles of butter on the spigot, no larger even than a pin's head, the churning proper is finished. A quarter of a turn of the handle now brings the spigot to its lowest point (nearest the ground), and immediately beneath it is placed a sieve over a vessel to receive, or over a conduit to carry away, the butter-milk. The spigot being then slightly drawn out, the butter-milk escapes and filters through the sieve, which retains even the smallest particle of butter which may be carried out with the butter-milk. When most of the butter-milk has thus been withdrawn from the churn, the small quantity of escaped butter is replaced in it, and fresh spring water is also put into the churn until it is half-full. Three or four turns are then given, and the mixture of water and butter-milk is again withdrawn as before. This process is repeated, often seven or eight times, until the water which comes out of the churn is as bright and as clear as when it was put into it.

These various washings and turnings completely cleanse the butter from the butter-milk from which it had been separated during the process of churning, and at the same time they consolidate gradually the particles which have been individually thoroughly scoured. At the end of the process the butter may be seen floating as one mass in a small lake of clear water. When removed from the churn by means of large wooden spoons or spatulæ, the butter requires no more working than is sufficient to consolidate it and express the particles of clear water from its interstices. The butter thus made goes direct to Paris,

* Compare the Report of the Judges on the Trials of Dairy Appliances at Bristol, *suprâ* p. 143.

and I am informed on high authority that the farmer receives for it as much as 2*s.* and upwards per English pound, according to the season.*

The mere fact of such high prices being given for first-class butter implies that there is comparatively little of it. In fact, it may be safely asserted that none of it comes to England, and that the butter which is still good enough to command higher prices than our own on the London market is made with far less care and skill than that just described. A careful inquiry into the manner in which butter is made in the several districts of Normandy has convinced me that, other things being equal, the quality of the butter depends upon the *earlier or later period at which the washing in the churn is commenced.* This is so far recognised by some of the dairy-farmers that they have their churns fitted with a glass window, to enable the eye to see and thus assist the ear to hear when the butter first begins to be formed.

Prevalaye Method.—This mode of butter-making takes its name from the historical Chateau near Rennes, in Brittany, where probably it was first introduced, or where very fine butter, in comparison with the general product of the district, was made many years ago. The old farm has long since disappeared, and at the date of my visit only six cows were kept in the dairy belonging to the chateau. To see the making of the real Prevalaye butter of the market I went to a farm about 10 miles from Rennes, and about 100 acres in extent, where 22 cows were kept. They were of all sorts, sizes, and colours, but most of them appeared to be crosses of the Norman and Breton breeds. The floors of the farm-house were of mud throughout, and in the principal apartment there were four large and lumbering bedsteads, which article of furniture was abundantly represented in the kitchen also. Everything about the place was primitive and old-fashioned except the churn and the manure-heap, which latter was well and solidly made. The churn was a revolving barrel-churn, differing from the Norman in having the fixed dashboards extending to its circumference. Madame was very proud of her churn, and believed it was the only one in the neighbourhood. Doubtless she was right, as the farmers in that district generally use an upright piston-churn, with a perforated dashboard at the end of the piston. The cows are milked very early in the morning and again at noon.

---

* As this Report is intended for the information of agriculturists, I have preferred to give throughout, when possible, the prices actually received by the farmers, instead of the market value; but in February this year (1879), the price of Isigny butter on the Paris market was quoted at more than 8 fr. per kilo. wholesale, or above 2*s.* 10*d.* per lb. avoirdupois.

The system of butter-making is curious. The morning's milk, for instance, is skimmed on the evening of the next day, that is, after thirty-six hours' standing, and the cream is put into the churn, together with the whole milk of another milking. The exact arrangement of this process depends upon the weather, as in summer butter is made every day, and therefore with fresh cream and milk; but in winter it would not be made more than twice a week, and consequently with staler cream, the skimmings from more frequent milkings, and with less whole milk in proportion. After the churning has proceeded for ten minutes or a quarter of an hour, according to the temperature, a quantity of pure water is added to the mixture of milk and cream in the churn. In summer, this water would be as cold as possible, but in winter it would be warmed more or less, according to the weather. On some farms, the temperature of the mixture is modified by placing into it an earthenware bottle, filled with warm or cold water, instead of turning the water itself into the churn. The butter comes slowly under this system, and takes generally between one and two hours, and in hard wintry weather even longer. The butter is not washed in the churn; in fact, on most farms it would be impossible to do this, in consequence of the piston-churn being almost universally used.* It is, however, well washed and worked in a kind of dish afterwards.

Some people assert that the butter made in this manner rivals that of Normandy; but whether the very choicest makes sold fresh, or the ordinary makes sold more or less salted, be taken as the standard of comparison, the crucial test of market price is largely in favour of Normandy. Nevertheless, the butter has a fine delicate taste when fresh; but to make it keep it requires, like all French butters, to undergo another process, which will be described presently.

In this district, as already mentioned, the cows are kept in the houses all the year round, except for a few hours in the morning and evening in summer. They get artificial grasses (chiefly lucerne) cut green at that time of year, and lucerne-hay, straw, roots, and bran, in the winter.

Brittany Butters.—In the different parts of Brittany, butter is

* Arthur Young mentions a dairy of cows in the Isle of France, "fed entirely with lucerne, and the butter excellent; I admired it much, and found the manufacture quite different from the common method. The milk is churned instead of the cream. Her (the Viscountess du Pont's) dairy-maid is from Bretagne, a province famous for good dairymaids. The evening's milk and the morning's are put together, and churned as soon as the latter is milked; the proper quantity of salt is added in the churn, and no washing or making in water, which these dairymaids hold to be a very bad method. Finer butter, of a more delicate flavour, was never tasted, than procured by this method from lucerne."—*Op. cit.*, vol. ii. p. 46.

made by systems which vary between that of Isigny, already described, to the churning of a mixture of cream and curd. In the most pronounced of the latter methods the milk is actually curdled by artificial means, so that to a certain extent curd and cream may rise together. In other cases the milk is not skimmed until after it has turned sour, which comes to nearly the same thing, as the souring of the milk causes the separation of a portion of the curd from the whey. The objects in view are to increase the quantity of so-called butter, and to obtain a constant supply of curd, which is a staple article of food for the Breton labourers who are fed on the farm, and indeed for people in more affluent circumstances. It need not be said that the money return from such an attempt to do two things together (namely, cream-rising and curd-separating), that ought to be done in succession, is not favourable to the pockets of those who follow it; but the Breton is, more than any other Frenchman, obstinate in his adherence to old practices, which even time and tradition should allow to be more honoured in the breach than the observance.

The Butter Trade.

A most essential element in the French butter-trade consists of the middlemen, who bring the producer and the consumer together; and the systematic, and even scientific, manner in which the collection, purification, packing, and exportation are carried out requires a brief notice to enable English and Irish dairy-farmers to understand the whole process by which their rivals are enabled to compete so successfully against them in their own markets.

French dairy-farms, where the butter made is not good enough to go direct to Parisian or provincial private customers, are generally small in size; and the quantity of butter made weekly on each is therefore inconsiderable. The butter is generally made twice a week in summer, and often not more than once a week in winter; but, however many times a week it may be made on these farms, one making always takes place on the day preceding the holding of the local weekly market. Each make of butter is wrapped in a clean linen cloth, and on a market-day * in Normandy and Brittany one may see scores

* The number of markets and fairs in France is something beyond belief; but so also are the number of vendors and the small quantity which each one thinks it worth while to bring to market. On this point, Arthur Young wrote in his graphic way, in 1788:—"August 9th, Market-day. Coming out of the town I met at least an hundred asses, some loaded with a bag, others a sack, but all apparently with a trifling burthen, and swarms of men and women; but a great proportion of all the labour of a country is idle in the midst of harvest, to supply a town which in England would be fed by $\frac{1}{10}$ of the people; whenever this swarm of

and even hundreds of women in the market-place of the towns, standing in double rows facing each other, and each with a basket before her containing one, two, or more lumps of butter (larger or smaller according to circumstances), separately enveloped in clean linen. This basket, or other baskets, may also contain a certain number of eggs, a few chicken (perhaps only a couple), some veal or pork, and any other marketable produce of the farm.

Confining myself for the present to the butter, the next step in the process is the advent of the butter-merchants. Some of these buy for sale to their customers in the neighbourhood, but they take only the best-made butter fit for immediate consumption and suited to the local taste. The great commerce, however, is made by the wholesale butter-merchants, or their "buyers," who taste, bargain, and at length buy little parcels of butter varying from half-a-dozen pounds or so upwards. The buyer has with him sundry large hampers, into which the separate lumps of butter are placed after they have been denuded of their linen wrappers, weighed, and paid for in coin of the realm. At the end of the day the merchant sends a greater or less number of these hampers filled, and generally over-filled, weighing up to 200 lbs. each, carefully covered over and secured by means of linen and canvas, to his "fabrique," either by road or rail, and there is enacted the next stage of the process.

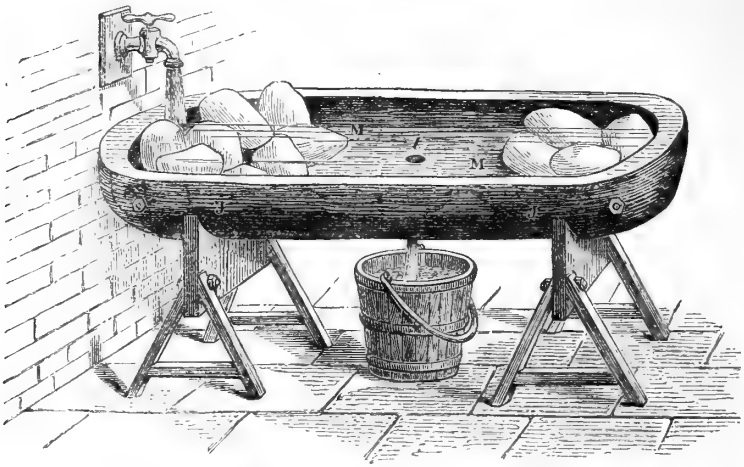
As soon as possible after arrival at the factory (*fabrique*) the baskets are uncovered, and an experienced "hand" takes out each lump of butter separately. By the evidence of his senses of smell and taste, the former being generally sufficient, he classifies them, as a rule, into three qualities. Each quality is then dealt with separately, according to its needs for the market for which it is destined.

The operations to which each quality of butter is subjected before packing are three, namely, kneading, washing, and salting. The kneading is continuous from the commencement of the washing to the end of the salting; and it should be added that in many cases an intermediate process, namely, that of colouring, is found necessary to fit the butter for some markets, where the sentimental quality of colour is considered as essential as the practical qualities of taste and smell.

Kneading has until recently been done almost entirely by hand; and even now in most small factories, and in a few large ones, the old method is practised. A long trough (Fig. 5, p. 304), having a hole fitted with a plug in the centre of its lowest part, is used in such cases, and strong men knead the butter with

trifles buzz in the market, I take a minute and vicious division of the soil for granted."—*Op. cit.*, vol. i. p. 39.

Fig. 5.—*Trough for Washing, Kneading, and Salting Butter* (after M. Pouriau*).



J. Trough on tressles. M. M. Lumps of butter.
t Hole fitted with plug, for the escape of water and butter-milk.

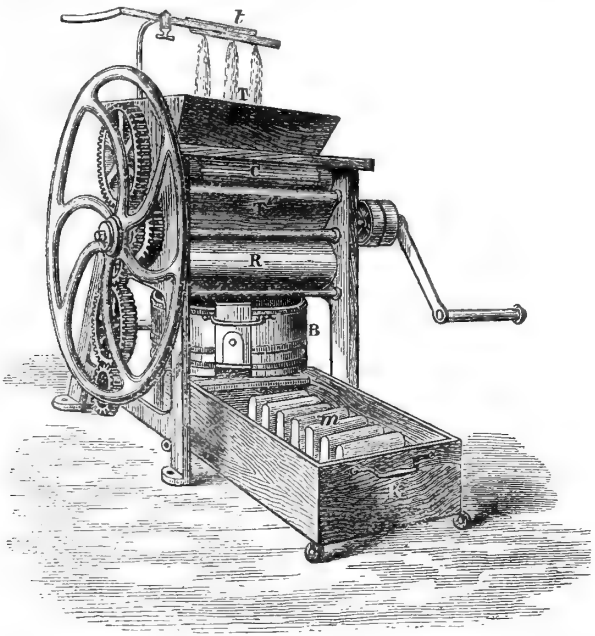
their fists, while water dribbles upon it and helps to wash out the butter-milk. The salt is afterwards incorporated in the butter by the same means.

At the factory of M. le Noë Bidard, at Rennes, the mixing and washing tables are specially designed to enable the very hard winter-butter of the district to be efficiently dealt with. They are constructed of solid oak from the floor to the surface, and are about 32 inches in height. The surface of the table is nearly flat, and is surrounded by a rim about six inches high. The butter having been sorted into qualities as already described, each lump is subdivided by means of a wooden knife and spread over the surface of the table. Six men armed with heavy wooden mallets then range themselves, three on each side of the table, and, keeping time like so many blacksmiths at an anvil, pound the butter into a more soft and tractable mass. This process being finished, the butter is transferred to a second table, where the washing, mixing, and salting are carried on in the usual manner.

Some years ago, a "Mixing-machine" (Figs. 6 and 7) was invented by M. Hauducœur; and it has found a certain amount of favour with some of the butter-merchants. It consists of a hopper, into which the butter is placed, leading to a pair of fluted rollers, between which the butter passes, and falls into a second hopper leading to a pair of smooth rollers. The butter

* 'La Laiterie,'—an admirable little book.

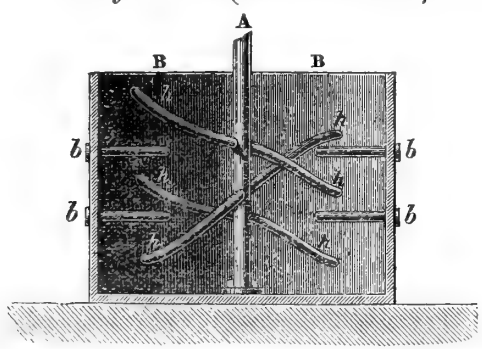
Fig. 6.—*View of M. Haudueœur's Butter-mixing Machine* (after M. Pouriau).



t Water-jet.
T First hopper.
C Fluted roller.
T′ Second hopper.
R Smooth roller.
B Mixing tub.
K Receiving tub.
m Expressed butter.

having passed through the smooth rollers, falls into a tub fitted with a vertical axis carrying curved arms (see Fig. 7), which

Fig. 7.—*Vertical Section of Mixing-tub of M. Haudueœur's Butter-mixing Machine* (after M. Pouriau).

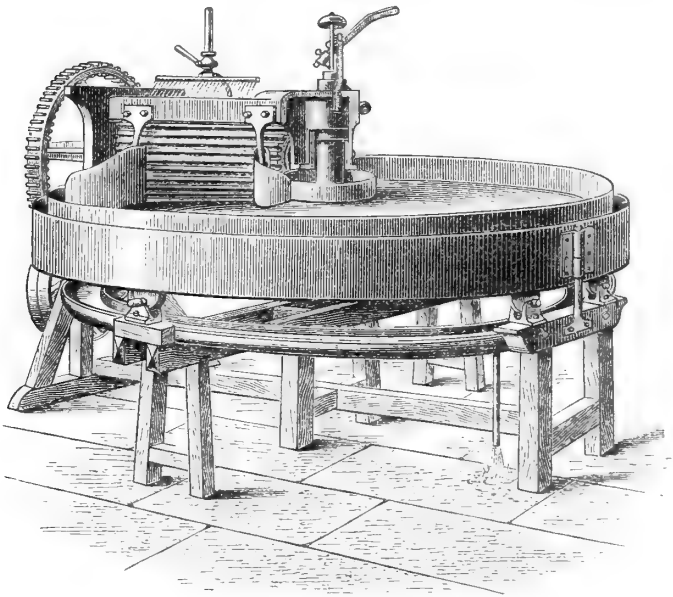


B B Circumference of tub.
b b Fixed arms on circumference.
h h Revolving curved arms on axis A.

revolve in a horizontal sense, and mix the butter thoroughly together. The butter then passes through an aperture close to the bottom of the tub into a trough placed to receive it.

To my mind, however, the most effectual and economical machine for mixing, washing, and salting the butter is one on the plan of the now well-known American and Danish Butter-workers, which were described years ago in this Journal by Mr. Coleman and myself,* and which received the Prize offered for such an implement at the Bristol Meeting.† This machine (Fig. 8), was invented and patented by a firm of French butter-

Fig. 8.—*View of Messrs. Gauthiot and Chollet's Butter-working Table.*



merchants, Messrs. Gauthiot and Chollet, of Saumur, and it is manufactured at some works close to their butter-factory. The machine consists of a slightly conical circular table, mounted upon a strong wooden cruciform pediment. Each wing of the pediment carries one or two fixed rollers, on which the table travels when in operation. In the engraving (Fig. 8), it will be noticed that there are two of these rollers or castors at what may be termed the foot of the pediment, and one at the side which is in view. These are supplemented by two others at the head of the pediment, under the gearing, and by one at the

* Second Series, vol. xi. p. 225, and vol. xiii. p. 83. † *Supra*, p. 147.

side which is out of sight. Immediately above the pediment is a channel which receives the expressed water or butter-milk, and carries it off by means of a pipe shown at the right-hand side of the engraving. The table itself is surrounded by an outside protecting rim. When in action, the table revolves towards the slightly bevelled cog-roller, which itself turns towards the table, and thus the butter is drawn between the two and the butter-milk squeezed out. The bevelled cog-roller is faced at each end by curved shields, which prevent the butter from clogging it at either end; and it is surmounted by a water-jet, which can be turned on or off as required. There are also arrangements for bringing the roller closer down to the table, or raising it higher up, according to the greater or less pressure which it is desirable to exert upon the butter. Some tables are furnished with an index which registers the revolutions made in the course of the day, and thus acts as a check upon the workpeople. A machine of this kind at Messrs. Brétel Brothers, at Valognes, was said to be capable of working, washing, and salting from 10 to 12 tons of butter per diem, requiring an indicated power of 3 horses by the 6-horse nominal fixed steam engine, which, however, is capable of being worked up to 12-horse power without difficulty. Such a butter-working machine, about 7 feet 3 inches in diameter, costs in France about 200*l*., but smaller machines can be purchased at a somewhat reduced cost.

The best butter destined for exportation to England is not actually salted, but for the final washing a strong solution of salt is used in place of pure water. Ordinary butter is salted by the admixture of from 3 to 5 per cent. of its weight of salt if for consumption in England, and as much as from 8 to 10 per cent. if intended for the Brazilian market. The fact is that French butter of ordinary qualities receives so much battering after it is made that whatever strength of grain it may have originally possessed is utterly destroyed. The article as "made up" by the butter-merchants is excellent for immediate consumption, but it will not keep very long without the addition of a large quantity of salt. Then the butter-merchants are less economical about the percentage of salt than they otherwise would be, because they receive a "drawback" upon the duty which they had previously paid on the quantity used.

Recently the French butter-merchants who export to Brazil have found the competition of the Danish tinned butter so severe that they have begun to copy their rivals. At one factory near Carentan (entirely devoted to this trade), Messrs. Denant and Co., of Periers, employ no less than 200 persons in making, filling, and packing the tins for exportation to tropical climates,

chiefly Brazil and the South American Republics. Messrs. Brétel Brothers, of Valogne, whose name is so well known on the London market, have also made a beginning in the same direction.

The extent of business done by some of the French butter-merchants is astonishing. For instance, the firm of Lepelletier, of Carentan, whose trade is solely with England, send the butter over in their own vessels, and in 1877 their exportation exceeded 4000 tons, and the estimated average value in France for the ten years then ended was nearly half a million sterling per annum. They estimated that in 1878 their trade would show an increase of about 30 per cent. over its average amount in the previous ten years. The following figures, showing that the trade of the house has doubled during the last twelve years, have been published by the firm as given by the Custom House authorities:—

Year.	Number of Packages.	Net Weight of Contents.
		Kilogrammes.*
1865	71,603	2,106,184
1866	97,593	2,732,604
1867	108,056	3,025,564
1875	120,200	3,435,025
1877	131,333	4,230,527

Packing.—French butter is sent to market in a great variety of packages, according to the requirements of each locality. For the London market, kegs holding about 70 lbs. each, crocks holding 50 lbs., and boxes containing one dozen 2-lb. rolls are most frequently seen. Extreme cleanliness and a refreshing neatness (amounting almost to what the French call *coquetterie*), are characteristic of all the methods, and they are further distinguished by the free and almost lavish use of clean linen linings. The kegs and linen linings cost about 1*s.* 9*d.* each; the crocks, which are protected by an outside basket, and also lined with linen, cost about 2*s.* each, including everything; and the boxes holding a dozen rolls cost about 9*d.* each, including linen and paper. In the hottest weather the boxes are sometimes double, the space between the two boxes being filled with cotton wadding. In fact, the French butter-merchants thoroughly realise the importance of delivering their wares in an attractive condition, entailing neither trouble nor waste upon

* For rough practical purposes 1000 kilogrammes may be taken to represent one ton avoirdupois.

the retailer.* Small tins for exportation to the tropics add something considerable to the price of the butter, namely, in round numbers, 2½*d.* for 1-lb. tins, 3½*d.* for 2 lbs., and 5*d.* for tins holding 4 lbs. Thus the cost per lb. decreases very rapidly in proportion to the augmentation in the size of the tin.

Cheese-Making.

Cheese is not regarded exactly in the same light in France as in England. With us it is much more of a food, with our neighbours across the Channel it is much more of a flavour. The working classes in both countries use cheese as food; but in France the skim-cheese is, as a rule, softer in texture and more pungent in flavour than it is in England. The kinds of cheese made, even in the north-western departments of France, are almost too numerous to mention; and they present every possible gradation from the "Suisse double crème," with its extraordinary richness and extreme delicacy, to a farmhouse skim-cheese, made for the resident labourers, that would blister an unaccustomed palate. It will be sufficient for me to sketch briefly the processes of manufacture, relating to a few different types of cheese made from cows' milk, in the district of France which I have already defined. These are (1) the "Bondon," or "Neufchâtel," with its more luscious outcome called "Suisse," and "Suisse double crème," (2) the "Camembert," which stands in the first rank of French soft whole-milk cheeses, (3) the Livarot, a soft skim-cheese; and (4) the well known Gruyère, as an example of a hard cheese having a distinct individuality.

To show how far this is from exhausting the list, I reprint the following abstract of a classification of French cheeses, from Professor Pouriau's valuable work entitled, "La Laiterie," (p. 231):—

Soft Cheeses	Fresh Cheese ..	Crème, Double Crème (called *suisses*), Neufchâtel, Bondons, Malakoffs, Coulommiers, Gournay, Mont d'Or, &c.
	Cured Cheese ..	Marolles, Rollot, Macquelines, Compiègne, Neufchâtel, Camembert, Livarot, Pont l'Evêque, Mignot, Brie, Coulommiers, Troyes, Mont d'Or, Saint Florentin, Senecterre, and many others.
Hard Cheeses	Pressed and salted, but not cooked ..	Dutch (made in France), Bergue, Cantal, or Auvergne, Septmoncel, Gex, Mont Cenis, Géromé (dry), Sassanage, Roquefort.
	Pressed, salted, and cooked ..	French Gruyère, Port du Salut, Rangiport.

* On this point I may be allowed to quote the remark of an English friend:—"My cheesemonger said to me the other day, 'Look here at this French box—I open it (which he did),—here is the butter fit to weigh out to you without an atom of loss. Now let us break open this cask of Irish: you see I have to scrape it all round and lose a lot, besides the trouble.'"

Bondon.—The head-quarters of this class of cheese may be regarded as the district of Bray in the Seine-Inférieure, having the little town of Neufchâtel as its capital. In fact it is known in England better as "Neufchâtel" than as "Bondon," and many people are under the impression that the little cylindrical cheeses are imported from the town of Neufchâtel in Switzerland. This delusion has been fostered by the fact that the variety of the cheese which has a certain proportion of cream added to the curd, is called in Paris "Suisse double crème;" but the epithet no more indicates the nationality of the cheese than it does that of the Parish Beadle, who is also known as "le Suisse."

The process of manufacture, as I saw it near Monterolier under the guidance of M. Rasset, fils, the mayor of that commune, is as follows: The rennet is added to the milk, in pots holding about three gallons, at its natural temperature as it comes from the cow. Various devices are resorted to in the winter to preserve this temperature, without actually warming the milk. The pots may be warmed by immersion in scalding water; a number may be placed in a case, and the inter-spaces filled up with straw and chaff, well packed in; or they may be wrapped up in the linen cloths which are afterwards used to receive the curd. The rennet being added to the milk, it is left for many hours, even as many as forty-eight, for the curd to be fully deposited; the curd is afterwards placed in a linen cloth, which is suspended from the four corners of a skeleton box, and is there left for several hours, to enable the whey to drain off. It is then transferred to a clean cloth, in which it is carefully folded up, and is submitted to pressure for about twelve hours, or at least until the whey ceases to run out; but the pressure is neither very great nor very even. The curd is next passed through cylindrical moulds, and the small cylindrical cheeses thus formed are at once salted on the outside. The cheeses, being then made, are put into a cellar on boards, each one being quite separate from its neighbours. In a few days, more or less according to the temperature, the first mould, thick and white, makes its appearance, and soon afterwards, especially in summer, the cheeses are sold fresh. At other times the process of "curing" is continued longer, and the cheeses are sold later at higher prices. On the whole, a fairly good maker will realize an average of 10 centimes (1*d.*) each, and as it is reckoned that the milk of an average Norman cow (say 400 gallons) in a comparatively poor district like that of Monterolier will make 4000 cheeses, this gives an average return of 16*l.* per cow per annum, without reckoning the value of the whey and the calf.

The much richer quality of cheese for immediate consumption, already referred to as "Suisse" and "Suisse double crème,"

is made near Gournay, and largely in Paris from curd sent from the same district. For the manufacture of the former a greater or less quantity of cream is mixed with the milk, before adding the rennet; and for the latter a large quantity of cream is mixed with the curd after the whey has been expressed, either on the farm or in Paris. The mixture of cream and curd, whether made in the country or in Paris, is rolled in cylindrical lumps, weighing about 3 oz. each, in paper bearing the name, address, &c., of the maker. These little cheeses are carefully packed in boxes lined with clean well-cut lengths of straw, which are also used to keep the rows of cheese in the box from impinging upon each other. The price realized for the cheese very much depends upon its appearance when sold to the *restaurateur*, or the private consumer; therefore great care is bestowed upon all the details of the packing. The straw is carefully combed to get out all leaves and adventitious matter, and is then cut by means of a fixed sharp knife, into the exact lengths required. It seemed to me remarkable that so simple a process of manufacture should not hitherto have been adopted in England, as such cheeses, imported from France, have a considerable sale in London at high prices.

Camembert.—Of all the soft kinds of cheese made in France, the Camembert, when properly manufactured, is no doubt the king. Its rivals are the Brie and the Coulommiers, but the more unwieldy shape and shorter season of the former, and the restricted manufacture of the latter, deprive their competition of any serious importance. On the other hand, the popularity of the Camembert has so increased the demand, that many of the smaller, and especially of the newer, makers take too much toll in the shape of cream, before they commence the process of cheese-making, and thus tend to kill the goose that lays the golden eggs. When properly made, the Camembert quite deserves the eulogium passed upon it by the Reporter of the Jury, at the Paris Dairy Show in 1874: "It surpasses in delicacy everything that the ingenuity of the cheese manufacturer has been able to invent, to flatter the most fastidious palate."* This result cannot, however, be obtained without great care, some experience, and especially a most watchful attention to the details of the process of curing. Many of the successful makers of this kind of cheese believe that they possess a valuable secret in their method of procedure, and not unnaturally are averse from giving technical information to a possible competitor, or even to an outsider. I visited several Camembert dairies, which are generally situated in the Pays

* Richardson, *op. cit.*, p. 165.

d'Auge, although there are some also in Le Bessin; but I have found it necessary to discard my notes on all but three dairies, namely, one in Le Bessin, near Isigny (that of the Marquis de Cussey de Jucoville), and two in the Pays d'Auge, that of M. Paynel at Mesnil Mauger, near Lisieux (whose grandmother first made this kind of cheese, in 1791, at Camembert in Orne), and one near Livarot, where I was taken by that disinterested and enthusiastic pioneer of agricultural progress, the Viscount de Neuville, President of the Société d'Encouragement de Lisieux.

Even in these dairies there are differences in the details of the various processes of making and curing, and it must frankly be admitted that Camembert cheese-making is still a "rule-of-thumb" procedure, and has not yet been reduced to scientific principles.

The cows are generally milked three times a day, namely, at 4.30 A.M., 11.30 A.M., and 6 P.M. In most dairies the evening's milk is lightly skimmed in the morning, after having stood 12 hours, and butter is made with the cream. The skimmed milk is divided into two portions, one of which is added to the morning's and the other to the midday's milking. The mixture of two-thirds whole and one-third skim milk is immediately put into earthenware vessels, holding about 12 to 15 gallons each, and sufficient rennet is added to make the curd fit to be transferred to the cheese-moulds in about three or four hours, or perhaps after a longer interval in winter. It should be mentioned that, before adding the rennet, the milk is brought to about the temperature which it is supposed to have had when it was drawn from the cow, say about 86° Fahr. After adding the rennet, its mixture with the milk is ensured by a gentle stirring, and the pots are then covered with a square board. The curd is known to be ready for removal when it does not adhere to the back of the finger placed gently upon it, and when the liquid which runs off the finger is as nearly as possible colourless.

When ready, the curd is carefully transferred, without breaking it more than is possible, to perforated moulds, of the same diameter as a Camembert cheese (say 4 inches), but about three times the height.* The moulds are placed on reed mats, resting on slightly inclined slabs made of slate, cement, or other hard material, and having a gutter near the outer edge. The curd remains in the moulds about 24 to even 48 hours, according to

* Practice differs considerably at this stage of the process. Some makers prefer to add new curd from time to time, as the first shrinks in consequence of the drainage of the whey; others prefer high moulds and putting as much curd in them at first as will allow for probable shrinkage.

the season, being turned upside down after an interval of 12 to 24 hours, that is to say, when sufficiently drained at the bottom. After the turning, the face of the cheese that is then inside the moulds is sprinkled with salt, and about 12 hours afterwards the opposite face and the rim of the cheese are also salted. The cheeses are then placed on movable shelves round the walls of the dairy for a day or two, according to the season and to the capacity of the room in relation to the number of cheeses made daily; and thus ends the first stage in the manufacture of this renowned dairy product. It must be understood, however, that the above description is merely general, and that each maker knows by experience how much rennet of an ascertained strength he should add to the milk, how long the curd takes, under different circumstances of weather, to become fit for putting into the moulds, how large the perforations in the moulds should be, how long the cheeses should be left to drain in the moulds, how often they should be turned, how much salt should be used, and so on through the whole of the processes which constitute the manufacture and the curing of the cheese.

The curing of Camembert cheese consists of two distinct stages. In the first stage, the cheeses are placed in a thoroughly well ventilated room ("drying room"), on shelves made of narrow strips of wood, having narrow intervals between them, or of ordinary planks, covered with reed mats or clean rye-straw. The great point is to secure as dry an atmosphere and as equable a temperature as possible, and the greatest ingenuity is exercised in efforts to attain these objects. Generally the windows are numerous and small, placed at different heights, and furnished with three fittings, viz., with glass, to exclude air, but not light, when the glass is shut; with a wooden shutter, to enable both light and air to be excluded; and with a wire-gauze fitting, which will admit both light and air, but will exclude flies and all kinds of winged insects, which are the great bane of the curer of soft cheese. The cheeses, as a rule, are turned every day at the commencement of their curing, and every other day afterwards while they are in the drying room, except in damp weather, when daily turning is absolutely necessary. During the sojourn in the drying room the cheeses show the following succession of appearances:—After an interval of three or four days they become speckled, in another week they are covered with a thick crop of white mould; by degrees the colour of this mould deepens to a dark yellow, while the outside of the cheese becomes less and less sticky. At the end of about a month, when the cheese no longer sticks to the fingers, it is taken to the finishing room, where light is nearly excluded, and where the atmosphere is kept very still and slightly damp. Here they

remain for three or four weeks, being turned every day or every two days, according to the season, and carefully examined periodically. When ready for market—that is to say, in winter when they are ripe, and in summer when they are about half-ripe—they are made up into packets of six, by means of straw and paper, with a skill and tidiness worthy of the reputation of the cheese.

The prices of Camembert cheese vary very much according to quality and season. A really good cheese should have a mottled external appearance, the colours being a reddish brown and a dirty yellow, the former predominating. If the colour is too bright it betokens a skim-cheese; as also does an elasticity or toughness when the cheese is pressed on the face with the finger. The quantity of milk required to make a Camembert cheese varies a little, according to its richness in cream when used for cheese-making. Thus the Marquis de Cussey de Jucoville, who has a dairy of 30 cows, near Isigny, makes 8 cheeses from 24½ pints of milk, or about 3 pints of milk to a cheese; but he takes off no cream. He sells them at from 7½ to 8 francs (6*s.* to 6*s.* 5*d.*) the dozen; and assuming that his cows (which are remarkably good ones, and graze on some of the best pastures in Normandy, having a rent value there of nearly 5*l.* per acre) give an average of 550 gallons, their gross return in cheese alone would be 36*l.* per head per annum, if it were all made into Camembert. Indeed, the Marquis himself told me that the average gross return of his cows exceeded 40*l.* per head per annum.

Mons. Paynel, of Mesnil Mauger, near Lisieux, received a large gold medal from the Imperial Jury in the district competition of 1867. His farming then was similar to what it is now, but was not on so large a scale; and his books showed that in 1865 his 57 cows had given over 320,000 gallons of milk (an average of more than 550 gallons per head). With this milk he had made 2700 lbs. of butter, 3125 Livarot cheeses, and 59,146 Camembert cheeses (using 3½ pints of milk to each). Putting these products at the prices which a French farmer may obtain for them now-a-days, supposing them to be of the best quality, they make a total of over 32*l.* per cow, without reckoning the value of butter-milk, whey, or calf. Considering that the rent of his land is about 56*s.* per acre, his net return would probably not fall far short of that of the Marquis de Cussey de Jucoville.

Livarot Cheese.—This is a skim-cheese about twice the weight of a Camembert. It takes its name from a town in the Pays d'Auge, about nine miles from Lisieux—the head-quarters of the manufacture of Camembert cheese at the present time. It is estimated that the quantity of Livarot cheese made annually has a value of about 80,000*l.*—more or less according to the season,

and that about one-fourth of the value of the make, not of its quantity, is sold in Paris, which takes the best of this as of every other kind of French dairy-produce. It is a moot point in the district of Livarot whether, on the whole, it is not more profitable to make a large quantity of butter, and Livarot cheese with the skim-milk, than a small quantity of butter and Camembert cheese with whole or nearly whole milk. My observations have led me to the conclusion that unskilful or inattentive cheese-makers do best by adopting the Livarot system, because they get rid of the cheese about a week or ten days after it is made, and thus avoid the losses which would result from any mistake in the management of the delicate processes of curing the Camembert. On the other hand, a good manager of Camembert in all its stages would surrender some portion of the profit which is the payment for his skill if he made Livarot instead of Camembert, except perhaps in the middle of the summer, when the weather is too hot for the manufacture of really fine Camembert.

As in the case of every other kind of skim-cheese, the quality of the Livarot depends upon the length of time which the milk has stood before being skimmed. This varies, according to the markets, from 24 to 48 hours. The skim-milk is warmed to the natural temperature of milk just drawn from the cow, and rennet is added sufficient to coagulate the curd in from half an hour to two hours, according to the season—the shorter time being of course in the height of summer. When fit, the curd is taken with a bowl out of the pail in which it was set; it is spread upon a cloth placed upon a table-shelf, which is furnished with a gutter to carry off the whey, and is there broken up fine. The broken curd is then placed in perforated tin moulds upon the usual reed mats, and left to drain, the moulds being frequently turned at the commencement of the process, namely, every twenty or thirty minutes. By degrees the turning takes place less frequently, but the cheeses are kept in moulds, first of tin and afterwards of wood, until they are sold at the next available market-day. As a rule, the cheeses are thus kept by the farmer for seven or eight days, after which time they are sold "green," as we should term it, to dealers, who cure and otherwise prepare them for the market.

At the establishments of the curers the cheese undergoes a variety of operations. It is first carefully salted on the outside, and then placed for about three weeks in the drying room, which is similar to that used for Camembert cheese. While there it is frequently turned, and at first rubbed with a strong solution of salt so long as it readily absorbs the brine. After about three weeks, it is moved to the "finishing room" or "cellar," also similarly arranged to that used for completing the curing of

Camembert. Here it is turned at frequent intervals and, after a lapse of a week or ten days, it is tightly bound by winding round its rim strips of the leaf of the reed-mace (*Typha latifolia*), the object being to prevent the bursting of the cheese by the fermentation which is now going on inside it. After another six weeks, or two months, or longer, when the cheese has acquired the bright red colour which is thought characteristic of a good Livarot, it is sold for consumption. In the event of this colour not coming naturally to a proper hue, many curers do not hesitate to paint the cheese with annatto.

The size and the quality (richness) of Livarot cheeses vary so much that it is difficult to give a mean price for them, but the richer cheeses are smaller and mature sooner than the poorer qualities. The price of good cheeses may be put at from 1 franc to 1 shilling each, retail, except in Lent, when they are much dearer, on account of the greater demand for them during that fast. As to the return to the makers, M. Pouriau puts the *net* amount from butter and from this kind of cheese at from 10*l.* to 12*l.* on the average, rising to 14*l.* in exceptionally well-managed dairies; and he quotes a dairy where the *gross* return per cow is between 22*l.* and 24*l.* per annum.

Gruyère.—Of all foreign kinds of cheese, the Gruyère is probably the best known to English travellers at home and abroad, as it can generally be obtained at the best hotels both in London and the provinces. The familiarity of the consumer with the product is not, however, accompanied by an exact knowledge of the process of its manufacture; and I have heard the most amusing descriptions given by people who assumed the air of being well informed on such subjects. As an illustration of the prevailing ignorance, I may quote the following description of Gruyère from one of the favourite text-books still used in the elementary private schools:—"Gruyère, made in a small town of Switzerland, in the canton of Friburg. It is a mixture of goats' and ewes' milk, and very strong in flavour"!

In France alone the value of the Gruyère cheese made annually is estimated at more than 600,000*l.* Owing to differences in the physical and economical conditions of the districts in which it is manufactured, there are many variations in the size and quality of the cheese, as well as in the arrangements under which it is made, cured, and marketed. It would require a lengthy treatise to enter into all these details, and I therefore propose to confine myself to a brief description of the making of the cheese, as I saw it done at M. Lecomte's factory, near Montereau, about 50 miles south of Paris.

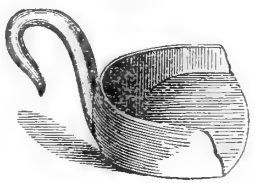
Gruyère cheeses have a sort of cart-wheel shape, that is to say, they are thin cylinders of large diameter. In weight they

vary from under half a hundredweight to more than three times as much.

M. Lecomte has four cheese-tubs placed round a central pillar in the middle of his cheese room. Each of these tubs holds nearly 70 gallons of milk, and is heated by means of steam injected into a coil of pipes in the space beneath the false bottom. The whey is drawn off by means of a siphon, and runs through pipes into one of the three whey-tanks, which have a total capacity of nearly 9000 gallons. One man has charge of each tub, and if the supply of milk is sufficient he can make five cheeses per diem; and at the time I visited the factory, seventeen cheeses per day were being made. Each cheese is numbered, and is also branded with the distinguishing mark of the dairyman, who receives a bonus for each really good cheese that he makes, in addition to his daily wages. Considering the rapidity with which such heavy cheeses—weighing at M. Lecomte's about 66 lbs. each,—can be turned off by one man without any attendant, the following brief sketch of the *modus operandi* may be interesting.

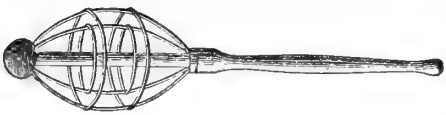
The milk, measuring as nearly as possible 66 gallons, having been put into the tub, the temperature is raised to 95° Fahr., when about 21 oz. of rennet are added and carefully mixed with it, and the tub is covered. The curd comes in about 40 minutes, and the whey is then raised to a temperature of 138° to 140°, at which it is kept for another 40 minutes to cook the curd. Towards the end of this period, a large flat wooden shovel (Fig. 9) is placed carefully upon the top of the curd, the progress of which is now and then tested by the attendant gently moving the shovel over its surface. If the shovel sticks or hangs to the curd, the cooking process is still incomplete, but when it glides smoothly along, the attendant commences cutting the curd gently into horizontal slices which he removes towards the rim of the tub. After this has been done sufficiently, in his judgment, he uses one of various forms of curd-breakers. Amongst others, I noticed a wooden pole armed with a number of projecting slanting spikes, which cross one another along about two feet of its length, also a hoop and band arrangement, such as is shown in Fig. 10. Great practice appears to be necessary in order to acquire skill in this part of the operation, and the object in view appears to be to break up the curd as evenly but as ruggedly as possible. Towards the end of the breaking, the dairyman, by varying the movement of the breaker, collects all

Fig 9.— *Curd-shovel used in making Gruyère cheese.*



the curd into the centre of the vat, and then allows a few moments for the rotatory movement of the whey to subside. He then takes a cloth, puts one corner between his teeth, holds the lateral corners in each hand, holding at the same time a curved iron wire over which the remaining corner of the cloth is folded. He then bends over the cheese-tub, and by deftly passing the wire completely under the heap of curd collects it all in the cloth. The clothful of curd is then taken out and placed in a frame of the size and shape of the cheese, the ends are carefully folded over the top of the mass of curd, a board is put on, and the cheese submitted to pressure for 24 hours, in the course of which it is turned seven or eight times. After pressure it is rubbed with salt and transferred to a cellar, where it is turned and rubbed every other day for about three months, when it is fit for market.

Fig. 10.—*Curd-breaker for Gruyère cheese.*



It may not be out of place to add that M. Lecomte, making as he does over 1000 gallons of milk per day into Gruyère cheese, necessarily has a large pig-feeding establishment. Between 400 and 500 pigs are fattened annually, a large number being bred by himself, and the remainder bought in as required. Their food consists of crushed maize, more or less cooked and mixed with whey. It is given them three times a day in a series of small yards, where each pig knows his own trough. They eat as much as they like at the fixed hours, but have nothing in the intervals.

Conclusion.

Readers of the foregoing pages should now be in a position to consider the inferences which may be derived from the facts therein given. At the present time the annual value of the imports of butter into the United Kingdom is in round numbers ten millions sterling, and of this large amount more than one-third is paid annually to France. The imports of cheese amount to about five millions annually, but of this very little comes from the other side of the Channel. The inference from these facts seems clear:—Americans, Swedes, Danes, and even Russians, have learnt from us how to make Cheddar cheese, and have flooded our markets with practically our own wares, which they can afford to sell profitably at prices such as have ruled this year (even as low as $2\frac{1}{2}d.$ per lb.), which mean simple ruin to the English cheese-maker. On the other hand, France sends us

excellent butter in summer and autumn, Denmark and Sweden in winter, and Holland in spring and summer, to an extent that similarly influences the price of English goods, and similarly affects the receipts of our native dairy-farmers. We have taught all the world how to make a cheese that will travel with little or no injury, and that can be made of such uniform quality that hundreds may be safely bought *as per sample.* Cannot we in our turn learn how to make butter and soft cheese of good quality and in large quantities? It is to no purpose to state that the butter made by such or such an English farmer is as good as any in the world. The question is, How much of such butter can be delivered every week to market? The best English butter is, no doubt, the best in the world; but, unfortunately for us, it is so scarce that it is rarely seen, and is practically out of the wholesale market. Shopkeepers, hotel-keepers, and others who supply the public, must buy a commodity the quality of which they know will be uniform throughout. This cannot at present be expected of English, and still less of Irish goods, and therefore purveyors purchase foreign—French, Dutch, and Danish—according to its season. What Mr. Gilbert Murray states on another page (142) is doubtless true of many other large hotels as well as the Midland; and although in some shops one may see butter labelled "Best Dorset," "Best Aylesbury," &c., the expert knows that in many cases these designations are trade fictions, and that Normandy is generally the home of the article in question.

With regard to butter-making, the first step of course is to produce a better material than the bulk of English butter now is, and the second is to secure uniformity of quality, either by the establishment of co-operative butter-factories, or by the interposition of a middle-man like the French butter-merchant. The first step is comparatively easy, for it only requires a firm conviction that sour milk causes a mixture of curd with the cream, and that for every shilling gained in quantity by skimming sour milk, five shillings are lost in the quality of the butter made from it. This conviction having been arrived at, milk would always be skimmed while still sweet, and thus a minimum of curd would be taken off with the cream; while by thoroughly washing the butter in the churn as soon as it comes, all curd and butter-milk would be washed out from every particle of butter. In the absence of fermentable and putrefying matter, there can be no fermentation and no putrefaction. It is the very thoroughness with which the French achieve this result that causes some people to pronounce their butter tasteless!

This result, however, is not obtained by the French farmer in the case of the butter which finds its way to the English market;

but, as I have already described in detail, by a merchant who completes the process of butter-making. What has been so successful in France ought surely to succeed in England, and more particularly in Ireland. It seems to me that here is an opening for men of enterprise and capital, and with proper management their success ought not to be doubtful. If, however, the farmers of a district wish to retain for themselves the profits of this new middle-man, let them combine and furnish their own factory, appoint a paid manager, and sell a uniform quality of butter under their own brand.

With regard to cheese, my conviction is that it will not pay any but the very best English cheese-makers to produce hard cheese many years longer. The American competition is becoming more and more keen, the markets are becoming more and more glutted, not only with cheese, but with tinned meats and other kinds of cheap food which tend to lessen the consumption of cheese, and therefore the price of cheese will necessarily be kept low. All the while, the price of really good fresh butter is high, because there is so little of it, most of the foreign butter being more or less salted. Therefore it seems well worth a vigorous effort on the part of the English farmer to come once more to the front with a good quality of the less transportable article.

I have devoted some pages to a description of three kinds of soft French cheese, two being articles of luxury, while the third (a skim-cheese) is very much superior to anything made from skim-milk in this country. The processes of manufacture which I have described entail no hard manual labour, and are therefore infinitely better adapted to a woman's organization than the slavery of making a huge Cheddar. Again, the process of curing in its various stages is of a nature to interest the dairy-woman in its ultimate success. The making of such cheeses on farms which are too far from a railway or large town for the milk to be sold unmanufactured would be very remunerative at those seasons when the markets are glutted with butter of all nationalities; but such a practice would necessitate vigilant supervision on the part of the farmer's wife.

The usual answer to such a suggestion as that Neufchâtel, Camembert, and Livarot cheeses should be made in England will doubtless be given, namely, "Our climate and soil are not adapted to that class of cheese." But if Scotchmen, Americans, Canadians, Swedes, Russians, &c., can make Cheddar cheese, if Frenchmen and Russians can make the Edam cheese of Holland and the Gruyère of Switzerland, why should not English dairy-farmers make soft French cheeses? Mr. Allender, Managing Director of the Aylesbury Dairy Company, has kindly

given me the following account of his first experiment in this direction, which is at any rate sufficiently encouraging to stimulate further attempts based on more exact knowledge of the French processes:—

"Having visited some dairy farms in France, where Bondons, Neufchâtel, Camembert, Petit Suisse Crème, and other small cheeses are made, I saw no reason why such cheese should not be made in this country. These cheeses are made from 'soft or uncooked paste' (pâte), as distinguishing them from the hard or cooked curd, from which cheese is principally made in England. I took good ordinary fresh milk, as received in London from the country, and without heating it, added a small quantity of rennet. I left the milk to stand in a moderately warm temperature, until curd had formed, from 12 to 18 hours. I had a crate made, similar to those I had seen in France, about 3 ft. 6 in. long, 15 in. wide, and 18 in. deep. I tied the corners of a coarse cloth to the corners of this crate, allowing the cloth to form a bag in the crate, the bottom of the bag being some inches from the bottom of the crate. Into this bag I poured the curdled milk, and allowed it to remain until the whey had fairly drained from it. The corners of the cloth were then loosened, and the mass of curd, still in the cloth, allowed to fall to the bottom of the crate; the edges of the cloth were then folded over the curd, thus making it into 'a parcel,' as it were. A piece of board was placed upon the lumps of curd, and upon this a weight, so as to squeeze out more whey. This draining process occupied some twelve hours. On opening the cloth the curd was found in a solid, but not too hard mass. This was broken up with the hand and worked into a smooth paste. It was then moulded into tin rings, about four inches in diameter, and an inch deep. The paste was squeezed into the ring, and the small cheeses thus made were shaken out on to a board. The boards were cut so as to take three dozen cheeses in three rows. The cheeses were then put into a vault to dry and ripen. The French farmer who gave me the most information on the subject, told me that there was but little difference in the paste from which the various cheeses are made, the great difference being the manipulation, especially in the treatment of the cheese during the drying and ripening process. This I found to be the case with me. Having but little time to spare for my experiments, and the attention I could give being very irregular, I obtained all sorts of results, some of my cheeses turning out very fair specimens, closely resembling Camemberts, others of quite a different character, more like the Bondon or Neufchâtel. These differences were mainly brought about by variations of temperature, both during the period of curdling and while the cheeses were drying. The state of the atmosphere had also much to do with the differences of production. Of one thing, however, I am fully convinced as the result of my trials, viz., that these soft cheeses can be just as well made in England as in France, and that much of the money now paid to our neighbours for that product of the dairy might be put into the pockets of our own farmers; but, to succeed, great personal and minute attention must be bestowed upon the manufacture, and it is in this alone that the Frenchman has the advantage over the Englishman, an advantage which need not exist.

"I may mention that the delicious cream-cheese, sold in Paris as Fromage Gervais,* is made by adding to the 'paste,' as described above, as much cream as the paste or curd will carry or absorb. This is done by the hand; the paste is sent from the farm at Gournay to Paris every evening during the season, the cream is then worked up with it and the cheeses are made up and

* This is the "Suisse double crème" described on p. 37, "Gervais" being the name of one of the largest and best-known makers.—H. M. J.

put each into its little paper envelope in Paris during the night. M. Gervais sends out over 400,000 of these cheeses daily in Paris alone."

It will have been noticed that I have laid very little stress upon the nature and quality of the food given to milch-cows, and, indeed, have almost ignored the processes which lead up to the *production* of the milk. In England, the breeding, rearing, and feeding of cattle, whether for the production of meat or milk, are more thoroughly understood than in any country in the world. The necessity of cleanliness in the dairy, the influence even of the water which the cows drink, and with which the butter is washed, upon the flavour of the product, are also generally recognized. But where English dairy-farmers fail is in the *process of manufacture*, and that is why I have concentrated so much of my attention upon that branch of the subject.

In conclusion, I wish to express my very grateful thanks to the numerous French dairy-farmers and butter-merchants whom I visited, and who treated me, one and all, with a most charming frankness and hospitality. I am afraid that I never properly recognize the value of my nationality, except when I am in a foreign country, but when I am in France I am almost made patriotically conceited. Several of the gentlemen whom I visited are mentioned in the foregoing pages; but in addition I am specially indebted for introductions to them and others:—to my distinguished friend M. E. Tisserand, Director of the Department of Agriculture, to my courteous and able colleagues, M. E. Lecouteux, Secretary-General of the French Agricultural Society, and M. Delalonde, Secretary-General of the French Dairy Society, and last, though by no means least, to my enthusiastic friend Mr. Gibson-Richardson, the author of the 'Corn and Cattle Producing Districts of France,' who left no stone unturned, and no pen untried, to facilitate the object of my journey,—of which this Report forms the first part of the record.

XI.—*The late* Sir William Miles, Bart., M.P., *Vice-President, and Ex-President of the Society.*

Dear Mr. Jenkins,

I send you a memoir of the late Sir W. Miles' work in connection with the early Shows of our Society, which Sir B. T. Brandreth Gibbs has furnished to me. In addition to the work in the Showyard, Sir William took interest in practical experiments on his farm, which he communicated to the early numbers of the 'Journal.' I find several short notices from him on experiments which he had made with Poitevins manure, Daniell's

manure, refuse from the glue manufactories, guano, several reports on different species of wheat selected by the Council, cultivation of mangolds as compared with swedes, &c. Nor did he confine himself only to the results obtained in the field; he sends analyses by Liebig, Davy, and Herepath—quotes a quaint old book on agriculture written by C. Venlo, and published at Winchester in 1773, describing experiments on wheat culture at that period. Again, he is Chairman of the Local Committee at Bristol in 1842, down at Pusey watching trials of ploughs, lending his own steam engines at Leigh Court in order that some experiments may be made in consequence of a protest in 1847, and in every way showing the most lively interest in the welfare of the Society. And all this time he was Member for East Somerset, for which division of the county he sat from 1834 until his voluntary retirement in 1865, and at the same period was for thirty-five years Chairman of Quarter Sessions. He was no idle politician; he took a very decided line as a partizan, and threw into this pursuit his characteristic warmth and ardour. Indeed he appears to me to have well represented the class of English country gentlemen—a keen sportsman, a hard rider with Sir R. Sutton at Lincoln in his youth, an earnest politician, an able magistrate, an enlightened agriculturist, and a warm-hearted friend. It is to men like him who sat on the early Council of the Society, that we owe much of the large spirit which has guided its discussions. Its founders, of whom Sir W. Miles was one, were generally men who combined a love of agriculture with keen political instincts; but both in the Council and the Showyard party feelings were forgotten; and, whether Whig or Tory, Protectionist or Free Trader, they worked harmoniously for the interests of the agriculture which they loved, and, by their example, handed down a traditional good feeling to their successors in the Council, which I am happy to think exists at this day as strong as ever.

I am, truly yours,
JOHN DENT DENT.

Ribston Hall, 31*st December*, 1878.

IN MEMORIAM. By Sir B. T. BRANDRETH GIBBS, Vice-President of the Society.

By the death of Sir William Miles, Bart. (late M.P. for Somersetshire), the Society has lost one of its original Members of Council, and one who served the offices of Steward of Implements, of Vice-President, and of President.

To fully trace his connection with the Society would almost involve writing its early history, or, at least, an account of the

rise and progress of the Machinery department, as well as of the first trials of implements and of that which has eventually been denominated the "Prize-System."

It is, indeed, true that at the first Meeting at Oxford in 1839 the exhibition of implements was on a very limited scale; and although at that time the few waggon-loads of machinery which were exhibited were looked upon as a good display, the whole only occupied comparatively a few square yards of uncovered space in the centre of the Show-ground.

The same may be said of the succeeding Meeting at Cambridge, where there certainly was an increase, still it was not sufficient to necessitate special shedding being provided, nor regular stands allotted. The few machines that required protection were stored in the unoccupied end of one of the live-stock sheds.

It was, however, at the Liverpool Meeting in 1841 that this portion of the Show began to assume large proportions: special shedding was devoted to implements, which were classified, as far as possible, according to their respective uses.

Now, for the first time, there were three Stewards of Implements; and Mr. Miles, in conjunction with Mr. Handley and Mr. W. Patten, undertook this department, and conducted the Trials which were then made under the auspices of the Society on the race-course at Aintree.

At the Bristol Meeting, in 1842, for the first time, each exhibitor showed his entire collection together, on what has since been called his Stand; and on this occasion more extended trials than hitherto were made. Again Mr. Miles was a Steward, together with Mr. Shelley (afterwards Sir John V. Shelley) and Mr. John Benett, M.P.

At Derby, in 1843, the Implement department became still further developed, and, for the first time, each machine had a reference number corresponding with the Catalogue, Mr. Miles was again a Steward, in conjunction with Mr. Shelley and Mr. Pusey, M.P. Indeed, at the succeeding Meetings at Southampton, Shrewsbury, Newcastle, and Northampton, Mr. Miles and Mr. Shelley continued to discharge the arduous duties of Stewards.

It was at the Meeting at Southampton that Mr. Miles suggested the plan of having all the implements which had been entered for trial brought together and classified for the inspection of the Judges; but this arrangement, however good in theory, had subsequently to be abandoned in consequence of the increasing number of exhibits from year to year.

From the above remarks, it will be seen that Mr. Miles acted as a Steward of Implements for seven consecutive years; and

that, too, at a time when the duties were both important and laborious; for during his Stewardship the Exhibition had grown from a couple of sheds to an extent which even then gave promise of the vast proportions which the Shows have attained in recent years.

It is somewhat remarkable that, although Mr. Miles took such an active part in connection with this department of the Society's Shows, his name does not appear conspicuously in the Journals of that period. This, however, may be accounted for from the fact that it was not then the custom for the Senior Steward of the year either to write the Reports or any introductory comments on those furnished by the Judges. The amount of work which Mr. Miles did for the Society, therefore, must not be measured by this silence; for there can be no doubt that many of the difficulties inherent to the establishment of an Exhibition of Implements, and to conducting the Trials, were in a great measure overcome by his personal activity and perseverance.

Although Mr. Miles retired from the office of Steward after the Northampton Meeting, in 1847, he continued to take a leading part in the proceedings of the Society as a Member of the Council, and, from the year 1852, as one of the Vice-Presidents.

In 1854–5 he occupied the important office of President of the Society; and in this capacity he headed a deputation sent by the Council to the Universal Exhibition of 1855 in Paris, where he and his colleagues were received, both by the Emperor, the Ministers, and the learned Societies of that capital, with marked courtesy.

The Society's Meeting at Carlisle being held under his Presidency, he most handsomely offered his corn crops for a thorough trial of reaping-machines during the harvest; and he received and entertained the Stewards, Judges, and officials, with the greatest hospitality, at his seat, Leigh Court, near Bristol.

The Report on the Trials concluded with the following tribute: "The Judges cannot close this Report without expressing their obligations and thanks to Mr. Miles for the great facilities offered by him for the trials of these machines, and for his obliging kindness to themselves and to all engaged in the experiments."

In concluding these imperfect remarks, it is only just that ample testimony should be borne to the unwearied energy which Sir William Miles (then Mr. Miles) displayed in everything he undertook. No day was too long for him, and no obstacle too great to be surmounted; and whatever want of previous preparations may have occasionally marked his administration,

this was always more than counterbalanced by his readiness and devotion in carrying out whatever he saw to be necessary. He was endowed with great promptitude of decision, an attribute often requisite in the early days of the Society's Trials of Implements, when the exhibitors and their employés were not so well trained as they have become by subsequent experience; and although he required his decisions to be carried out to the very letter, and enforced them when necessary, there always predominated a frankness and manliness of character which won the confidence of all with whom he came in contact, and endeared him to those who had the advantage of being associated with him as colleagues.

By the writer, who is now the only remaining officer who shared his labour in the early days of the Society's history, his memory will ever be cherished, and sincerely respected.

XII.—*The late Mr. T. C. Booth, of Warlaby.* By H. Chandos-Pole-Gell, of Hopton Hall, Derbyshire.

The subject of this brief memoir, Thomas Christopher Booth, was born at Killerby Hall, near Catterick, Yorkshire, on December 3rd, 1832. He was the third son of the late Mr. John Booth, of Killerby, and of Jane, daughter of Mr. Charles Wright, of Cleasby, one of the spirited purchasers of the celebrated bull "Comet" (155), Coates's 'Herd Book.' Mrs. Booth's mother was the daughter of Mr. Charge, of Barton, near Darlington, another of the joint owners of this animal. Mr. Booth's paternal grandfather, Mr. Thomas Booth, of Killerby and Warlaby, was one of the earliest breeders of Shorthorns, and founded the herd which has been handed down to the present time through three generations. The present Booth family may thus be said to have been born and reared in an atmosphere of Shorthorn interests, and the mantle of their ancestors fell on no unworthy shoulders, as both the brothers who engaged in farming pursuits have made a mark in their profession. Mr. T. C. Booth was educated at the Kepier Grammar School at Houghton-le-Spring, in the county of Durham, under the mastership of the Rev. J. Young, D.D. During his school career he distinguished himself by steady application to work in school hours, and earnest attention to play when work was over: he was generally head of his class, a leader in all boyish games, and a universal favourite with his fellows. At about the age of sixteen he entered the office of Messrs. T. and H. Littledale and Co., brokers, of Liverpool, to whom he was apprenticed for the usual term of five years. Here,

attention to his duties soon attracted the notice of his employers, who found him not only steady and industrious, but one on whose energy and thoroughness they could rely. Mr. John Torr, now Member for Liverpool, at that time one of the partners in the firm, has told me that, during his connection with the house of Littledale, he never had greater pleasure in endorsing the indentures of any of their apprentices than in the case of Mr. Booth. Whilst serving his term of five years, spent amongst the busy docks and warehouses of that great commercial town, and in the office of those well-known merchants, Mr. Booth acquired accurate business habits, which stood him in good stead when he became an agriculturist. Having been trained to a mercantile life, he naturally endeavoured to find an opening for his abilities, and at one time contemplated going out to India; but the death of his two elder brothers, followed soon after, in 1857, by that of his father, altered his position so materially that he decided on remaining in England. He returned home, and entered into partnership with his brother John in the management of the farm at Killerby. From this time forward his whole attention was given to agriculture, and he spared no pains to make himself master of his business. Whilst the brothers were together they worked very hard, and brought the farm into a high state of cultivation, improving their stock of every kind, and soon showing to their friends and neighbours that the old "Booth blood" was to be found in the sons of the house as well as in the cattle. At this time Mr. Booth took great interest in the volunteer movement, and was instrumental in raising the 14th North York Rifle Volunteers, of which corps he became the first captain, on January 8th, 1860. He was an excellent shot, and at Wimbledon, in 1862, succeeded in being placed sixth for the Queen's prize, winning an Enfield rifle. The next step in Mr. Booth's life was a most important one. On April 28th, 1864, he married Fanny, daughter of the Rev. W. Lockwood, vicar of Kirkby Fleetham, Yorkshire, and granddaughter of the Rev. W. Glaister, who was well known in the early days of Shorthorns, and owned the once celebrated bull "Son of Denton" (198). It will be seen that by this marriage a fresh infusion of the "blue blood" of Shorthorn breeders was introduced into the family at Warlaby, and we may fairly hope that, amongst the eight children left to deplore their father's loss, some will be found to inherit the taste and talent of their predecessors, and to carry on the pursuit which has made the name of "Booth" famous, not only in Great Britain and Ireland, but wherever the ubiquitous Shorthorn is found. The death of his uncle, Mr. Richard Booth, in 1864, put Mr. Booth in possession

of the family estate at Warlaby. The herd there then consisted of 31 females and 29 bulls, and was left by will to be sold. It was decided that Mr. T. C. Booth should become the purchaser, taking the stock at a valuation. The well-known auctioneer and judge of Shorthorns, Mr. W. Wetherell, and Mr. W. Torr, of Aylesby, were appointed arbitrators. On May 26th, 1865, the valuation was made, and Mr. Booth became owner of the Warlaby herd. At first all went well with him, and fortune seemed to smile upon her favourite; but, alas! a change soon came; that dreaded scourge, "foot-and-mouth disease," attacked the herd. After a time of great trouble and anxiety it passed away, but not without leaving sad traces behind. In 1865–66 the rinderpest appeared in England, and soon laid its hold on many of the farms surrounding Warlaby. Happily the energetic sanitary precautions which were taken averted the threatened evil, and the herd escaped. A brook which nearly surrounds the farmstead and home pastures was constantly patrolled, and no living thing allowed to cross it, as the plague was raging on the other side. Tar-barrels were constantly burning at different parts of the buildings; disinfectants were freely used; all servants, horses, carts, and carriages were placed in quarantine after being at any market; and even the cat that had strayed was not allowed to return to the premises.

This danger safely passed, matters seemed to progress favourably for a few years; but, in the great outbreak of 1870–1–2, "foot-and-mouth" again appeared, and with such dire results that in 1873 only three calves were born alive.

These sad troubles and reverses did not, however, quench Mr. Booth's energy; in spite of his anxieties, he was never cast down; the farm improvements were carried on without interruption. He rented a farm adjoining his own property, and soon brought it into good order, draining all the land that required it, grubbing up useless old fences, and laying the fields into such form as suited steam cultivation, which he was one of the first to introduce into his neighbourhood. Mr. Booth's activity of mind was not satisfied with merely attending to his own affairs; he also took great interest in the welfare of those around him. At the time of the restoration of his parish church of Ainderby he rendered most valuable assistance; he became a member of the Board of Guardians, and of the Highway Board, and at the time of his death was chairman of nearly all the local public bodies in the district. He was also a Member of Council of the Yorkshire Agricultural Society, and took an important part in its transactions. In 1868 he was elected Member of Council of the Royal Agricultural Society of England. Here his sound sense and capacity for business soon brought him to the front. For

three years he acted as a Steward of Implements, being most untiring in the performance of his duties, which were at times very arduous. Mr. Booth often took part in the discussions at the Council Meetings of the Society. Firm and decided in his opinions, he was always listened to with attention. He spoke his mind freely, but, however strongly he advocated his cause, never hurt the feelings of those who differed from him, and no man was more popular even with his opponents. These qualities were testified to by His Royal Highness the Prince of Wales, when, as President of the Royal Agricultural Society of England, he announced the death of Mr. Booth to the Council, at their Meeting last November, in the following terms:—

"It is my painful duty to announce to you the death of Mr. T. C. Booth, who has for ten years been on the Council of this Society, during which time he has been one of its most active members, serving as Steward of Finance, also of Implements, and Chairman of several important Committees. Of his work as an active member of the Yorkshire Agricultural Society, and other local associations, it is not necessary to speak. He is well known to us in regard to the untiring and unceasing efforts he made in conjunction with Mr. Jacob Wilson, for the passing of a measure for the prevention of contagious diseases in animals, watching with unflagging attention the proceedings of the Committee of the House of Commons in 1877, and the passing of the Act this last Session. I have always been told that he was a man of most equal mind and temper, fair and unprejudiced in all matters, holding his own judgment and opinion, but always prepared to give way when shown to be in error; one with whom especially it was a pleasure to work."

He was also one of the first promoters of the Shorthorn Society of Great Britain and Ireland. From its formation he was one of the "Editing Committee," and his colleagues in that office can speak to the efficient manner in which he did his share of their somewhat invidious work.

As a Judge of Shorthorns Mr. Booth was unsurpassed, and no man was more free from prejudice. As a breeder of a particular line of blood which had taken a very high position, he naturally preferred his own cattle to those of rival strains; but these considerations never biased his judgment, and he always "went for the best animal" when it appeared before him. Though constantly requested to act as Judge, he almost always refused, holding that the owner of so many bulls whose stock were being exhibited had better leave others to decide on the respective merits of the animals. In the early part of his career at Warlaby he himself showed occasionally, and the once familiar names of "Lady Fragrant," "Patricia," and "Commander-in-

Chief," &c., will remind some of my readers of the exciting Showyard conflicts of a few years ago. At the time of the Meeting of the Royal Agricultural Society of England at Oxford, in 1870, Mr. Booth's herd was in magnificent order; and probably no one man could have shown 13 such grand cows as were then running in the Burnaston Hill pasture at Warlaby, "Commander-in-Chief," the Sultan of the harem, being in his box a few hundred yards distant. A curious circumstance happened at this time, which I think I may be excused for recording here. Mr. Wright, of Chesterfield, once well known as a Judge of Shorthorns, and, at the time of which I am speaking, between eighty and ninety years of age, came to see the herd, and whilst looking at the cows, said, "It is almost fifty years to a day since I stood in this field with your grandfather. There were then, as now, 13 cows, as good as these, but of a different stamp, and the best of them was a cow called 'Dairymaid;' have you any of that family left?" Mr. Booth was happily able to reply, "Yes; and the one you selected to-day as the best animal here is descended directly from her." This anecdote Mr. Booth related to me a few days after it occurred, as we were admiring "Soldier's Daughter," the cow in question. After suffering such heavy losses through foot-and-mouth disease, Mr. Booth considered it advisable to relinquish exhibiting; his herd being so greatly reduced in numbers, he was afraid to run the risks which arise from over-feeding. He felt that the reputation of the Booth cattle was firmly established in the public mind, and their successes would not easily be forgotten; in addition to which many breeders, using his bulls, were exhibiting, and doing battle for him in public, whilst he at home was quietly preparing for them the means by which they achieved their victories. At first he had considerable difficulty in supplying the wants of his customers, who were anxiously awaiting the arrival of young bulls, to take the place of the veterans with which they were obliged to content themselves. The few young animals to be let were eagerly snapped up, and still the cry was "More; more." In the year 1875 took place the sale of the late Mr. W. Torr's Shorthorns at Aylesby, and here, after due consultation with his most intimate friends and supporters, Mr. Booth determined to purchase the larger portion of the "Bright" and "Riby" families, both of which were descended from "Anna" by "Pilot" (496), sold at Mr. R. Booth's sale at Studley, near Ripon, in 1834. Accordingly, twelve of the best of these animals came into Mr. Booth's possession, at an average of about 1000 guineas each, and were taken back to the pastures whence they originally sprang. In their ancestral home they have been most fortunate, and have multiplied in a thoroughly satisfactory

manner; and the Warlaby herd, thus reinforced, has increased so well that, at the beginning of this year (1878), Mr. Booth was enabled to let a number of the finest young bulls that were ever at Warlaby at one time. Though so well known in his own part of the world, and though so much connected with local interests, Mr. Booth had not taken any very active part in public matters until the year 1877, when he supported his friend, Mr. Jacob Wilson, in his endeavours to get a bill brought before Parliament for the better regulation of our foreign-cattle trade. Convinced of the immense importance of such a measure to farmers of all classes, and to the community at large, as, owing to the effects of imported diseases, our stock of cattle and sheep had diminished in an alarming degree, Mr. Booth devoted his time and attention to the subject; and, when the Duke of Richmond brought in his "Contagious Diseases (Animals) Bill" of last session, he was, in conjunction with Mr. Wilson, indefatigable in his endeavours to obtain evidence to show how greatly the consumer would be benefited if the farmer could carry on his business with immunity from disease. Mr. Booth was in communication with members of Parliament, railway directors and managers, cattle salesmen, cattle importers, dead-meat importers both in London and Liverpool, and with persons of every class from whom he thought that anything was to be learned; and, through his and Mr. Wilson's exertions, a mass of information was obtained, which was of inestimable value when the witnesses were examined before the Committee of the House of Commons through whose hands the Bill passed. The moment he was released from the business connected with this Act, Mr. Booth went to attend to his duties at the Royal Agricultural Society's Show at Bristol, which occupied him for more than a week. He then returned home, to prepare for the Exhibition of the Yorkshire Agricultural Society, which was to be held at Northallerton. Being so near home he was very desirous that it should be a success, and he gave the officials all the assistance that lay in his power. How far his object was gained was seen in the large and splendid show of all classes of stock, and in the excellence of the general arrangements. This labour over, Mr. Booth found leisure for a few days' grouse shooting, and keenly enjoyed his favourite sport; he then was obliged to go to Ireland, where it was evident that he felt the fatigue of travelling very much, and where it was supposed that he caught cold. Returning home, he found himself too ill to resist any further the necessity for rest and care, and he at once placed himself in the doctor's hands. The supposed cold soon developed into low fever, of which, no doubt, the seeds had been sown before the journey to Ireland. At first

all went on favourably; but bad symptoms appeared; he became rapidly worse; and, at 5 A.M. on the morning of the 7th of September, passed away from us one of the kindest, best, and truest-hearted men that it has been my lot to know; a man who fulfilled every relation of life as a Christian should do; a good husband, father, and friend; simple, honest, straightforward, and single-minded; always striving to do his duty in the station of life in which he was placed. Long will his memory be cherished by those who knew and loved him. Long will that handsome face and quick cheery voice be missed from the council-rooms of those societies to which he belonged. Long will he be mourned by those friends and neighbours in whose welfare he took such an active interest. Amongst the many good and great men that Yorkshire has produced, none has gone to his grave more truly lamented than he, so recently cut off in the prime of life and the fulness of his strength, our dear friend "Tom Booth."

XIII.—*Report on the Field and Feeding Experiments conducted at Woburn, on behalf of the Royal Agricultural Society of England, during the Year* 1878. By Dr. Augustus Voelcker, F.R.S., Consulting Chemist to the Society.

The Experiments on the Continuous Growth of Wheat.

The mineral manures were sown broadcast on the 2nd of November, 1877, before the seed was sown, and the dung also was applied in autumn. The seed—Browick wheat—was drilled in on the 5th of November, 1877, and the salts of ammonia and nitrate of soda were top-dressed on the 4th of March, 1878.

The harvest was begun on the more mature plots on the 2nd of August, and the whole of the produce of the several plots was carted and stacked on the 19th of August, and threshed out on the 16th of October, 1878, yielding results which are embodied in the Table on the opposite page.

The wheat on all the plots was more or less blighted, and on several plots attacked in places by the red maggot. The hot weather which set in at the beginning of July brought on the wheat very fast. During a period of four weeks and three days in June and July no rain had fallen; and when it rained at last, towards the middle of July, the wheat had ceased growing, and did not come out well in the ear on some of the plots, especially on plot 4, dressed with minerals alone, and plot 3, top-dressed in spring with nitrate of soda alone.

PRODUCE OF WHEAT. SECOND SEASON, 1878.

PLOTS.	MANURES PER ACRE.	PRODUCE PER ACRE.			
		Dressed Corn.			Straw, Chaff, &c.
		Weight.	Number of Bushels.	Weight per Bushel.	
		lbs.		lbs.	cwts. qrs. lbs.
1	Unmanured	943	15·8	60	19 2 4
2	200 lbs. ammonia-salts, alone (applied in the spring)	1053	16·7	63	21 1 16
3	275 lbs. nitrate of soda (applied in the spring)	695	11·9	58·4	19 2 0
4	200 lbs. sulphate of potash, 100 lbs. sulphate of soda, 100 lbs. sulphate of magnesia, 3½ cwt. superphosphate of lime	651	10·4	62·6	18 1 6
5	200 lbs. sulph. potash, 100 lbs. sulph. soda, 100 lbs. sulph. magnesia, 3½ cwts. superphosphate of lime, and 200 lbs. ammonia-salts (in spring)	777	13	59·8	18 2 20
6	200 lbs. sulph. potash, 100 lbs. sulph. soda, 100 lbs. sulph. magnesia, 3½ cwts. superphosphate of lime, and 275 lbs. nitrate of soda (in spring)	842	14	60·1	23 2 19
7	Unmanured	704	12	58·6	18 3 9
8	200 lbs. sulph. potash, 100 lbs. sulph. soda, 100 lbs. sulph. magnesia, 3½ cwts. superphosphate of lime, and 400 lbs. ammonia-salts (in spring)	1661	27	61·5	42 1 0
9	200 lbs. sulph. potash, 100 lbs. sulph. soda, 100 lbs. sulph. magnesia, 3½ cwts. superphosphate of lime, and 550 lbs. nitrate of soda (in spring)	1658	26·1	63·5	42 3 0
10	Farmyard-manure, estimated to contain nitrogen = 100 lbs. ammonia, made from 376 lbs. decorticated cotton-cake, 940 lbs. maize-meal, 12,857 lbs. mangolds, 3215 lbs. wheat-straw, as food; and 3164 lbs. barley-straw as litter Weight 5 tons, 10½ cwts.	772	12·1	63·8	15 3 2
11	Farmyard-manure, estimated to contain nitrogen = 200 lbs. ammonia, made from 752 lbs. decorticated cotton-cake, 1880 lbs. maize-meal, 25,714 lbs. mangolds, 6430 lbs. wheat-straw chaff, as food; and 6328 lbs. barley-straw as litter. Weight, 11 tons 1 cwt. ..	990	15·8	63·7	20 0 24

The ammonia plot 2 ripened three or four days before the nitrate of soda plot 3, and yielded a larger produce, both in corn and straw, than the latter.

With the exception of plot 8, manured with minerals and 400 lbs. of ammonia-salts, and plot 9, dressed with minerals and 550 lbs. of nitrate of soda, which produced about the same amount of corn and straw, the yield of all the other plots was very poor.

It will be borne in mind that, before the experiments on the continuous growth of wheat were begun, a crop of wheat, yielding $25\frac{1}{2}$ bushels of dressed corn and $20\frac{1}{2}$ cwts. of straw, was grown by the late tenant. The third crop of wheat in succession thus was grown in 1878, on very light sandy land, and it was to be expected that on such land the wheat-producing powers would materially decrease on the unmanured plots. Last year the unmanured plot 1 yielded $22\frac{1}{8}$ bushels of dressed corn, and the second unmanured plot 7, $20\frac{7}{8}$ bushels. In 1878 the produce on plot 1 was only $15\frac{3}{10}$ bushels, and on plot 7, 12 bushels. Neither mineral manures nor farmyard-manure, it will be seen, had any decidedly beneficial effect in 1878, which agrees well with the experience of the preceding year.

It should be mentioned, however, that the dung was applied to the land in a long and undecomposed condition, which had the effect of making the naturally very light soil still more loose and hollow; a circumstance which, no doubt, in some measure may account for the poor yield of wheat on the dunged plots 10 and 11.

In order to remedy this defect in this year's experiments, the dung of a given composition for the permanent wheat and barley experiments was made last autumn, and next season (1879) the dung will be applied to the wheat in a short rotten state as a top-dressing in spring; and care will be taken to keep the land as firm as possible.

Compared with last year's results, the produce in 1878 has considerably fallen off. Thus in 1877 the largest produce which was obtained on plot 8, manured with minerals and 400 lbs. of ammonia, amounted to $43\frac{1}{8}$ bushels of corn, and $48\frac{3}{8}$ cwts. of straw and chaff. In 1878 the greatest weight of corn was again produced on plot 8; but it amounted to only 27 bushels of corn. The yield of straw on plot 8, in 1878, weighed $42\frac{1}{4}$ cwts, as against $48\frac{1}{8}$ cwts. in 1877. The decrease in corn in 1878, it thus appears, was more marked than that of straw. The same remark applies to all the experimental plots, whether unmanured or dressed with various mineral and nitrogenous manures; they all yielded more straw in proportion to corn in 1878 than in the preceding season.

Although the experiments on the continuous growth of wheat on very light land certainly were not successful in an economical point of view, they are, nevertheless, instructive, as they appear to point in the direction that on very light soils wheat cannot be economically grown for a succession of years, even with the application of large quantities of artificial manures, the cost of which must prevent their being used in practice. It would, however, be premature to draw such a conclusion from the results of two years' experience in growing wheat in succession, but I fully anticipate that a few more seasons will definitely decide this question.

The following is the cost per acre of the artificials employed in the experiments on the continuous growth of wheat and barley:

		About £	s.
On Plot 2.	Ammonia-salts alone	2	2
„ 3.	Nitrate of soda alone	2	0
„ 4.	Minerals alone	3	5
„ 5.	Minerals and ammonia	5	7
„ 6.	Nitrate of soda and minerals	5	5
„ 8.	Ammonia and minerals	7	9
„ 9.	Nitrate of soda and minerals	7	5

The Experiments on the Continuous Growth of Barley.

The manures applied for the barley were the same as those for the wheat experiments.

The dung, which was made in the experimental boxes at Crawley Mill Farm, from a weighed quantity of food and litter, and was estimated to contain nitrogen corresponding to 100 lbs. of ammonia per acre for one plot, and to 200 lbs. of ammonia per acre for the other plot, was put upon the land on the 14th of February, before the barley was sown. The mineral manures as well as the ammonia-salts were sown broadcast on the 2nd of March, 1878, and the barley was drilled in on March 6th, 1878.

The barley-harvest began on the 8th of August, and the whole of the produce was carted and stacked on the 19th of August, and threshed out on the 21st of October, 1878.

The Table on p. 366 shows the produce obtained.

The permanent barley was light, slightly blighted, but not nearly so much so as the wheat grown by its side.

The barley was not well filled. The only plots on which the barley went down to some extent was plot 9, manured with minerals and 550 lbs. of nitrate of soda per acre. On all the other plots the crops stood well. On plot 9, it will be seen, more straw was produced than on any of the others.

PRODUCE OF BARLEY. SECOND SEASON, 1878.

PLOTS.	MANURES PER ACRE.	PRODUCE PER ACRE.					
		Dressed Corn.			Straw, Chaff, &c.		
		Weight.	Number of Bushels.	Weight per Bushel.			
		lbs.		lbs.	cwts.	qrs.	lbs.
1	Unmanured	1226	24	51	16	0	16
2	200 lbs. ammonia-salts, alone	1864	36	51·8	23	2	8
3	275 lbs. nitrate of soda, alone	1632	30·1	49·3	23	3	2
4	200 lbs. sulphate of potash, 100 lbs. sulph. of soda, 100 lbs. sulph. magnesia, 3½ cwts. superphosphate of lime	1204	23·7	50·8	15	2	0
5	200 lbs. sulph. of potash, 100 lbs. sulph. of soda, 100 lbs. sulph. of magnesia, 3½ cwts. superphosphate of lime, and 200 lbs. ammonia-salts	1851	36·7	50·4	29	0	5
6	200 lbs. sulph. of potash, 100 lbs. sulph. of soda, 100 lbs. sulphate of magnesia, 3½ cwts. of superphosphate of lime, and 275 lbs. nitrate of soda	2145	42·6	50·3	28	3	11
7	Unmanured	950	19·3	49·7	12	1	4
8	200 lbs. sulph. of potash, 100 lbs. sulph. of soda, 100 lbs. sulph. of magnesia, 3½ cwts. of superphosphate of lime, and 400 lbs. ammonia-salts	2592	49·7	52·1	38	0	16
9	200 lbs. sulph. of potash, 100 lbs. sulph. of soda, 100 lbs. sulph. of magnesia, 3½ cwts. of superphosphate of lime, and 550 lbs. of nitrate of soda	2466	44·8	55	39	0	7
10	Farmyard-manure, estimated to contain nitrogen = 100 lbs. of ammonia, made from 376 lbs. decorticated cotton-cake, 940 lbs. maize-meal, 12,857 lbs. mangolds, 3215 lbs. wheat-straw chaff, as food; and 3164 lbs. barley-straw as litter. Weight 5 tons, 10½ cwts. ..	1096	22·7	48·3	16	1	24
11	Farmyard-manure, estimated to contain nitrogen = 200 lbs. ammonia, made from 752 lbs. decorticated cotton-cake, 1880 lbs. maize-meal, 25,714 lbs. mangolds, 6430 lbs. wheat-straw chaff, as food; and 6328 lbs. barley-straw as litter. Weight 11 tons, 1 cwt... ..	1534	29·7	51·6	19	2	0

On the whole, the experiments on the continuous growth of barley were quite as successful in 1878 as in the preceding year, and most of the results obtained in one year accord well with those of the other.

Thus, it will be seen that 200 lbs. of ammonia-salts alone applied on plot 2 produced 6 bushels more barley than 275 lbs. of nitrate of soda, containing the same amount of nitrogen.

In conformity with last year's experience, neither mineral-manures alone, nor farmyard-manure containing nitrogen equal to 100 lbs. of ammonia, had any effect on the barley; and double the quantity of dung on plot 11 only raised the produce in corn about 6 bushels over that of the unmanured plot No. 1. As last year, the heaviest crop in 1878 was produced on plot 8, manured with minerals and 400 lbs. of ammonia-salts. The produce on plot 8, it will be seen, amounted to nearly 50 bushels. Last year the same plot yielded $52\frac{5}{8}$ bushels.

Nitrate of soda, containing as much nitrogen as 400 lbs. of ammonia-salts, applied in conjunction with minerals on plot 9, produced about 5 bushels less barley than plot 8.

On the other hand, plot 6, manured with minerals and nitrate of soda containing as much nitrogen as the 200 lbs. of ammonia-salts, applied in conjunction with minerals to plot 5, produced more barley than plot 5.

It is singular that the produce in corn and straw of one of the unmanured plots (No. 7) was nearly the same in 1878 as it was in 1877.

Thus, last year No. 7 produced $19\frac{7}{8}$ bushels of barley and 12 cwts. of straw, and in 1878 the same plot yielded $19\frac{3}{10}$ bushels of corn and 12 cwts. 1 qr. 4 lbs. of straw.

Last year there was a considerable difference in the weight of produce of the unmanured plots, and a similar difference will be noticed again in the produce of the two unmanured plots 1 and 7. Last year, plot 1 yielded $22\frac{1}{4}$ bushels of corn and $13\frac{7}{8}$ cwts. of straw, and this year 24 bushels of corn and 16 cwts. 16 lbs. of straw.

It is well to bear in mind that similar differences in the productiveness of two parts of the same field treated precisely alike have a real existence, and that for this reason no undue inferences must be drawn from comparatively small differences in the results of field experiments with various fertilising materials.

The Experiments on Rotation.

The Woburn Rotation Experiments comprise 16 acres, divided into four sections, one for each rotation.

The following plan shows at one view the course of cropping of the 16 acres under Rotation Experiments:—

	Rotation No. 1 4 Acres.	Rotation No. 2. 4 Acres.	Rotation No. 3. 4 Acres.	Rotation No. 4. 4 Acres.
1877	Seeds	Roots	Barley with 7 cwt. rape-cake per acre.	
1878	Wheat	Barley	Seeds	Roots.
1879	Roots	Seeds	Wheat	Barley.
1880	Barley	Wheat	Roots	Seeds.
1881	..	..	Barley	Wheat.

Rotation No. 1.—1877, seeds; 1878, wheat; 1879, roots; 1880, barley.

The seeds were fed off in 1877 by 10 sheep kept on each of the four acres of this Rotation during 15 weeks. On the 1st acre (plot 1) the sheep consumed as additional food 728 lbs. of decorticated cotton-cake.

On the 2nd acre (plot 2) they consumed in 15 weeks 728 lbs. of maize meal.

On the 3rd and 4th acres (plots 3 and 4) no additional food was given; but on plot 3 the wheat was manured with artificial manures containing as much nitrogen and other fertilizing constituents as the manure from 728 lbs. of decorticated cotton-cake, namely, 275 lbs. of nitrate of soda, 73 lbs. of bone-ash made into superphosphate, 45½ lbs. of sulphate of potash, and 47½ lbs. of sulphate of magnesia. And, lastly, on the 4th acre (plot 4) the wheat was manured with artificial manures containing as much nitrogen and other fertilizing matters as the manure from 728 lbs. of maize-meal, namely, 58¼ lbs. of nitrate of soda, 11¾ lbs. of bone-ash made into superphosphate, 5 lbs. of sulphate of potash, and 8 lbs of sulphate of magnesia.

The wheat, Browick Wheat, a variety usually grown in the Woburn district, was sown on the 6th of November, 1877, and the artificial manures were top-dressed on the 9th of March, 1878.

The harvest was begun on the 11th of August; the wheat was carted and stacked on the 20th of August, and threshed out on the 15th of October.

The Table on the opposite page shows the produce obtained.

The wheat on all the four rotation acres, it will be seen, produced a full crop. With the exception of plot 3, which was top-dressed with nitrate of soda (275 lbs.) and artificial manures, which together contained an equivalent quantity of nitrogen and other fertilizing matters to the dung resulting from the consumption of 728 lbs. of decorticated cotton-cake, the produce in corn of the three remaining acres varied but little. The maize-plot (plot 2) yielded a few bushels more corn and rather less

Rotation Wheat. Produce of Rotation No. 1, in 1878, after Seeds fed on the Land in 1877.

Plots of One Acre.		Dressed Corn.				Straw, Chaff, &c.
		Head-Wheat.			Tail-Wheat.	
		Weight.	Bushels.	Weight per Bushel.	Weight.	Bushels.	Weight per Bushel.	
		cwts. qrs. lbs.		lbs.	cwts. qrs. lbs.		lbs.	tons. cwts. qrs. lbs.
1	Seeds fed off by sheep, which consumed 728 lbs. of decorticated cotton-cake ..	20 0 8½	37·3	60¼	1 2 18	3·7	49½	2 3 2 24
2	Seeds fed off by sheep, which consumed 728 lbs. of maize-meal	20 2 26	38·4	60½	2 1 3	5·1	49¾	2 1 0 23
3	Seeds fed off by sheep without cake or corn, top-dressed in spring with artificial manures, containing as much nitrogen, potash, phosphoric-acid, &c., as 728 lbs. of decorticated cotton-cake	25 0 0½	46·3	60½	1 3 10½	4·3	48	2 18 2 26
4	Fed off by sheep without cake or corn, top-dressed in spring with artificial manures, containing as much fertilizing matter as the dung from 728 lbs. of maize-meal	19 3 10	36·8	61¼	1 1 7½	3·1	46¾	2 9 3 4

straw than plot 1, upon which the seeds, the preceding year, had been eaten off with 728 lbs. of decorticated cotton-cake.

The wheat on plot 3 in the beginning of July looked very luxuriant and promised to produce the heaviest crop. The actual weighings of the produce showed that 9 bushels more corn and 15 cwts. more straw were produced when the fertilizing constituents in the dung resulting from the consumption of 728 lbs. of decorticated cotton-cake were supplied to the land in the shape of nitrate of soda, superphosphate, and potash, soda and magnesia-salts.

The contrast in the appearance of the wheat-crop in the rotation experiments, and in the experiments on the continuous growth of wheat was most striking throughout the whole season.

Rotation No. 2.—Four acres as follow: 1877, roots; 1878, barley, after mangolds fed on the land; 1879, seeds; 1880, wheat.

The mangolds in 1877 were grown on:

Plot 1. With dung, made from 3230 lbs. of straw as litter, 5000 lbs. mangolds, 1250 lbs. wheat-straw chaff, and 1000 lbs. cotton-cake.

Plot 2. With dung, made from 3230 lbs. of straw as litter, 5000 lbs. mangolds, 1250 lbs. wheat-straw chaff, and 1000 lbs. of maize-meal.

Plot 3. With dung, made from 3230 lbs. of straw as litter, 5000 lbs. of mangolds, 1250 lbs. of wheat-chaff, and artificial manure containing two-thirds as much nitrogen and other constituents of the manure from 1000 lbs. decorticated cotton-cake, namely, 248 lbs. nitrate of soda, 100 lbs. bone-ash (made into superphosphate), 62½ lbs. sulphate of potash, and 65 lbs. sulphate of magnesia.

Plot 4. With dung, made from 3230 lbs. of straw as litter, 5000 lbs. mangolds, 1250 lbs. wheat-straw chaff, and artificial manure containing as much nitrogen and other constituents as the manure from 1000 lbs. maize-meal, namely, 80 lbs. nitrate of soda, 16¼ lbs. bone-ash (made into superphosphate) 7 lbs. sulphate of potash, and 11 lbs. sulphate of magnesia.

The succeeding barley on plots 1, 2, and 4 was grown without artificial manure; on plot 3 with artificial manure containing one-third as much nitrogen as the manure from 1000 lbs. of decorticated cotton-cake, namely, 124 lbs. of nitrate of soda, applied as a top-dressing on the 20th of March, 1878.

The barley was drilled on the 16th of March, and the crop cut on the 15th of August, the produce from plots 1 and 3 were carted and stacked on the 28th of August, and that from plots 2 and 4 on the 2nd of September. The barley was threshed out on the 21st and 22nd of October.

The produce of the four rotation-barley acres is given in the following Table:

ROTATION BARLEY. PRODUCE OF ROTATION No. 2, IN 1878, AFTER MANGOLDS FED ON THE LAND.

Plots of One Acre.		Dressed Corn. Head-Corn. Weight.	Head-Corn. Bushels.	Head-Corn. Weight per Bushel.	Tail-Corn. Weight.	Tail-Corn. Bushels.	Tail-Corn. Weight per Bushel.	Straw, Chaff, &c.
		cwts. qrs. lbs.		lbs.	cwts. qrs. lbs.		lbs.	tons. cwts. qrs. lbs.
1	Without artificials (cotton-cake plot) ..	18 1 9	37·2	55¼	1 2 23½	4·1	46½	1 8 3 7
2	Without artificials (maize plot)	17 3 16¾	36·7	54½	0 3 13	2·1	46½	1 9 0 15
3	With artificial manure, containing one-third as much nitrogen as the manure from 1000 lbs. decorticated cotton cake, namely, 124 lbs. nitrate of soda	22 0 15¾	49·6	54½	0 3 0	1·8	46	1 15 2 25
4	Without artificial manure	16 0 22	33·3	54½	1 1 3	3·1	46½	1 9 1 20

It will be seen that the barley crop on plot 1, after mangolds, manured with dung from 1000 lbs. of decorticated cotton-cake, produced a few bushels more corn than on plot 2, manured with dung resulting from the consumption of 1000 lbs. of maize-meal; but the differences in the amount of produce on plots 1, 2, and 3, on the whole, are inconsiderable. On the other hand, nitrate of soda applied at the rate of 124 lbs., or little more than 1 cwt. per acre, had the effect of producing an increase of about 12 bushels of head-corn and nearly 7 cwts. of straw over the produce of plot 1, after mangolds grown with cotton-cake dung.

Rotation No. 3, *commencing* 1878.—Area under experiment, four acres.

Previous Cropping.—Seeds failed in 1874. Spring tares 1875, fed off with 5½ cwts. cake per acre. Barley 1876: produce per acre—dressed corn, 16 bushels; offal corn, 1½ bushel; straw, 9½ cwts. Barley 1877, with 7 cwts. of rape-cake per acre: produce per acre — dressed corn, 41¾ bushels; offal corn, 43 lbs.; straw, 25½ cwts.

Seeds 1878.—The four acres of clover and rye-grass have been fed off by sheep during the summer, and the land is now sown with wheat. On one acre 672 lbs. of decorticated cotton-cake have been consumed; on a second acre, 728 lbs. of Indian corn-meal; and the third and fourth acres were separately eaten off without any purchased food. On each of the four acres 10 sheep were put on in the beginning of May, and kept on the seeds until the 24th of July, when each lot was weighed and sold off. On the 10th of September the clover-seeds were again sufficiently advanced in growth to afford food for a fresh lot of sheep. On each acre 10 sheep were maintained until the 14th of October, one lot receiving cotton-cake, a second maize-meal, and the two remaining ones were fed upon clover-seeds only.

As there was still a fair bite of seeds after the sheep were taken off on the 14th of October, 5 more sheep were put on each acre of seeds, and kept thereon for a week.

The sheep which had cotton-cake and maize in addition to green clover, consumed on an average about ½ lb. of cake or meal per day.

The first lot of sheep going over the clover twice, and kept on the seeds from the 2nd May to the 24th of July, in that period of 12 weeks yielded the following increase in live-weight:

Plots.		Increase in Live-Weight. lbs.
1.	Fed-off by 10 sheep, with 448 lbs. decorticated cotton-cake; on the land 12 weeks	389¼
2.	Fed off by 10 sheep, with 448 lbs. maize-meal; on the land 12 weeks	391

Plots.		Increase in Live-Weight. lbs.
3.	Fed off by 10 sheep, without other food; on the land 12 weeks	286¾
4.	Fed-off by 10 sheep, without other food; on the land 12 weeks	295¾

It may be mentioned, that the sheep on plot 1, receiving decorticated cotton-cake as an additional food, gained more live-weight during the month of May and first week of June than the sheep on plot 2, which had maize-meal in addition to clover-seed. Towards the end of June and in the early part of July the weather got very hot, and then the sheep on plot 1 gained but little in weight, whilst those on maize made satisfactory progress. I have frequently noticed that a highly nitrogenous food like decorticated cotton-cake does not agree with stock when the weather gets very warm, and that maize during the warm summer months appears to be a more suitable food for fattening sheep and cattle.

The second lot of sheep was put upon clover-seeds on the 10th of September, and kept on the land until the 14th of October, in which period of five weeks they made the following increase in live-weight:

Plots.		Increase in Live-Weight. lbs.
1.	Clover-seeds fed-off by 10 sheep, with 224 lbs. of decorticated cotton-cake; kept on the land 5 weeeks	40½
2.	Clover-seeds fed-off by 10 sheep, with 280 lbs. of maize-meal; kept on the land 5 weeks	41½
3.	Clover-seeds fed-off by 10 sheep, without other food; on the land 5 weeks	86
4.	Clover-seeds fed-off by 10 sheep, without other food; on the land 5 weeks	27½

The third lot of sheep, kept on the land for one week and two days, gained as under:

Plots.		Increase in Live-Weight. lbs.
1.	Fed off by 5 sheep, kept on the land for 1 week and 2 days	18
2.	„ „ „	11
3.	„ „ „	19
4.	„ „ „	2

The following Table shows the number of sheep fed on each acre, the quantity of purchased food consumed (if any), the number of weeks the animals were kept on the land, and the total increase in live-weight yielded:—

ROTATION CLOVER SEEDS, 1878, AFTER BARLEY.

PLOTS.		Increase in Live-Weight. lbs.
1.	Fed-off by 10 sheep, with 672 lbs. of decorticated cotton-cake; on the land 17 weeks; and 5 sheep on the land 1 week and 2 days	447
2.	Fed-off by 10 sheep, with 728 lbs. of maize-meal; on the land 17 weeks; and 5 sheep on the land 1 week and 2 days..	443½
3.	Fed-off by 10 sheep, without other food; on the land 17 weeks; and 5 sheep on the land 1 week and 2 days	381¾
4.	Fed-off by 10 sheep, without other food; on the land 17 weeks; and 5 sheep on the land 1 week and 2 days	325¼

The average increase in live-weight obtained without purchased food was 353½ lbs. Deducting this increase from that obtained by the consumption of 672 lbs. of decorticated cotton-cake, we obtain 93½ lbs. as due to the cotton-cake; and making the same deduction in the case of the second acre, on which 728 lbs. of maize-meal were consumed by the sheep, the total increase due to the maize amounts to 90 lbs. Accordingly, 6 cwts. of decorticated cotton-cake produced almost the same additional increase in live-weight as 6½ cwts. of maize-meal.

The clover-plant stood very thick, and grew most luxuriantly, on the four acres, which, with the addition of 6 cwts. of decorticated cotton-cake and 6½ cwts. of maize-meal, produced an increase of 1597½ lbs. of live-weight, or 596 lbs. more than the seeds on Rotation No. 1 in 1877.

Rotation No. 4.—Four acres. Mangolds 1878.

Previous Cropping.—Seeds failed in 1874. Winter tares 1874–5, fed off with 5¼ cwts. cake per acre. Barley 1876: produce per acre—dressed corn, 37 bushels; offal corn, 8 bushels; straw, 24 cwts. Barley 1877, with 7 cwts. rape-cake per acre: produce per acre—dressed corn, 43 bushels; offal corn, 56 lbs.; straw, 26 cwts.

The mangolds were respectively manured as follows: one acre with dung made from a given quantity of straw as litter; and of mangolds and wheat-straw chaff as food, with 1000 lbs. of decorticated cotton-cake consumed in addition. The second acre with dung from the same amount of litter, and of mangolds and wheat-straw chaff as food, with the addition of 1000 lbs. of maize-meal. The third and fourth acres, each with dung from the same amount of litter, and of mangolds and wheat-straw chaff as food, without purchased food in addition; but one of them received artificial manure, supplying two-thirds as much nitrogen, and as much of the other constituents, as were estimated to be contained in the

manure from the 1000 lbs. of cotton-cake; and the other received artificial manure supplying the whole of the nitrogen and other constituents estimated to be contained in the manure from the 1000 lbs. of maize-meal. There was a fairly regular plant on all the four acres. Gaps in the rows here and there were filled up by transplanted roots, which grew fairly well, but did not nearly attain the dimensions of the roots not checked in their growth by transplanting.

The following Table shows the produce of each of the four acres:

ROTATION MANGOLDS, 1878, AFTER BARLEY.

PLOTS.		PRODUCE PER ACRE.							
		Roots.				Leaves.			
		tons.	cwts.	qrs.	lbs.	tons.	cwts.	qrs.	lbs.
1	With dung, made from 3230 lbs. straw as litter; 5000 lbs. mangolds; 1250 lbs. wheat-straw chaff, and 1000 lbs. decorticated cotton-cake	13	2	1	0	2	15	1	0
2	With dung, made from 3230 lbs. straw as litter; 5000 lbs. mangolds; 1250 lbs. wheat-straw chaff, and 1000 lbs. of maize-meal	11	16	0	0	2	15	0	21
3	With dung, made from 3230 lbs. straw as litter; 5000 lbs. mangolds; 1250 lbs. wheat-straw chaff; and artificial manure, containing two-thirds as much nitrogen, and the other constituents, of the manure from 1000 lbs. decorticated cotton-cake; namely, 248 lbs. nitrate of soda, 100 lbs. of bone-ash (made into superphosphate), 62½ lbs. sulphate of potash and 65 lbs. sulphate of magnesia	18	13	0	20	3	13	3	0
4	With dung, made from 3230 lbs. straw as litter; 5000 lbs. mangolds; 1250 lbs. wheat-straw chaff; and artificial manure, containing as much nitrogen, and other constituents, as the manure from 1000 lbs. maize-meal; namely, 80 lbs. nitrate of soda, 16¼ lbs. bone-ash (made into superphosphate), 7 lbs. sulphate of potash, and 11 lbs. sulphate of magnesia	12	15	1	12	3	3	3	5

The nitrate of soda on plots 3 and 4 was sown separately by hand, between the drills, after the plants were singled out and well established on the land. Its effect became plainly visible in the greater luxuriance of the young plants in about ten days,

after a gentle rain had washed the nitrate into the soil; and by the time the roots on plots 1 and 2 measured scarcely ½ an inch in diameter, those on plot 3 measured fully 1½ inch in diameter. Even on plot 4 the 80 lbs. of nitrate of soda produced a marked effect on the mangolds, but of course nothing like the effect of the 248 lbs. which had been applied to the third acre.

The roots on plot 4 were first taken up, and, in consequence, the leaves were greener, and produced a comparatively greater weight, than the leaves on plot 1, the roots upon which were taken up later.

It should also be mentioned, that the land on which the mangolds were grown was not quite level. On the side farthest from the road-side the ground forms a little hill, the highest part of which is in the acre occupied by plot 3, from whence it slopes down towards plot 2, turning nearly level on plot 1. On plot 3 the roots nearest to the road were much bigger than those at the opposite end, on the more elevated portion of the field. Plot 1 was the only plot of the four acres on which the roots were as large at the end farthest from the road as they were at the opposite, or road-side, end.

If it had not been for these inequalities in the level of the four-acre field the produce on plot 3, and, in a minor degree, on plots 4 and 2, would no doubt have been somewhat larger.

It appears from these experiments:

1. That the cotton-cake dung produced a somewhat heavier crop of mangolds than the maize dung.

2. That the constituents of the dung resulting from the consumption of either cotton-cake or maize-meal, when supplied in the shape of artificial manure, had a better effect on the mangold-crop than the dung from these articles of food.

XIV.—*Annual Report of the Consulting Chemist for* 1878.

By Dr. Augustus Voelcker, F.R.S.

The tabulated summary appended to this Report shows that the number of analyses made for the Members of the Royal Agricultural Society during the period between December 1877 and December 1878 has exceeded that of last year by 82, and has reached 724, which number has been surpassed only once, and then only by 6, viz., in 1871.

Nearly twice as many samples of Peruvian guano as last year were sent for analysis in 1878, owing, no doubt, to its variable composition. These, with few exceptions, were found to be genuine, but of very variable composition and value.

Judging from the number of samples of nitrate of soda which were received for analysis, this valuable ferliliser, notwithstanding the considerable rise in price which took place in the beginning of the present year, appears to have been extensively used by the British farmer, but not with uniform success. On light land more especially, where nitrate of soda was used as a top-dressing for cereal crops, it had the effect, in not a few instances which have come under my notice, of producing rather rank straw and thin grain.

As a rule, nitrate of soda is used as a spring top-dressing for wheat or barley and rarely for other crops. It may, however, be applied with much advantage to roots grown with superphosphate or bone-manure. The best time for applying nitrate of soda to root-crops is the period after the plants have been singled out; upon mangolds, from 1 to 1½ cwt. of nitrate of soda, sown by hand along the rows, has a marvellous effect, which is plainly visible in the course of a week or ten days, provided rain has fallen in that time and washed the nitrate into the soil. I had an opportunity of noticing, in the Woburn experiments this year, the striking effect of nitrate of soda on mangolds. On the acre in the rotation experiments where the mangolds were top-dressed in spring with 248 lbs. of nitrate of soda, the yield in cleaned and topped and tailed mangolds was 18 tons 13 cwts. and 20 lbs.; whilst on the adjoining acre of mangolds, not manured with nitrate of soda, the produce in clean roots was only 11 tons and 16 cwts.

In the Quarterly Reports of the Chemical Committee for the past year, reference has been made to several cases of grossly adulterated samples of nitrate of soda which were sent for analysis during that season. I need not therefore refer to them in detail in the Annual Report. It may, however, be satisfactory to the Members of the Society to learn that, in one of these adulteration cases, the buyer of a lot of nitrate of soda, which I found largely adulterated with common salt, was allowed by the seller to deduct no less than 62*l.* from the bill amounting to 162*l.* for nitrate of soda. This was not a bad return for the 10*s.* paid for the analysis and the annual subscription of a member of the Royal Agricultural Society.

Of the 41 samples of bone-dust analysed by me in 1878 there were some which, although bought as "pure raw bones," in point of fact were mixed raw and boiled bones (such as glue-maker's refuse). If it be borne in mind that raw bone-dust is worth from 1*l.* 5*s.* to 1*l.* 10*s.* per ton more than glue-maker's or steamed bones, purchasers of bone-dust will at once recognise the propriety of obtaining from dealers in bone-dust a written guarantee warranting the bone-dust to be made from clean *raw*

bone, and not to be mixed with steamed or glue-maker's refuse bones.

The majority of the 188 samples of artificial manures analysed by me were superphosphates, which I am glad to find are now much more generally sold on the strength of an analytical guarantee than in former years.

Special compound manures, on the other hand, are seldom sold by analysis, but in many cases are charged for at a much higher price than it costs a farmer to produce them, with little trouble, by mixing together in certain proportions well-known artificial manures which can be bought in every market-town.

The following case is an illustration of the preceding remarks.

A Member of the Society sent me for analysis a sample of wheat-manure, the price of which was 8*l.* 10*s.* This wheat-manure had the following composition:—

Moisture		16·01
Water of combination		4·52
Monobasic phosphate of lime		10·97
(Equal to tribasic phosphate of lime rendered soluble by acid)	(17·17)	
Insoluble phosphates		5·59
Sulphate of lime		37·51
Alkaline salts and magnesia		20·71
Including nitrate of soda	(18·24)	
Insoluble siliceous matter		4·69
		100·00

This manure, it will be seen, is a good and suitable top-dressing for wheat; but 8*l.* 10*s.* is a stiffish price for a manure which is nothing more nor less than a mixture of superphosphate with nitrate of soda.

Superphosphate guaranteed to contain 25 per cent. of soluble phosphate can be bought readily at 5*l.* a ton, and nitrate of soda at 17*l.* a ton. A mixture of 4 tons of superphosphate, costing 20*l.*, and 1 ton of nitrate of soda, at 17*l.*, in all costs 37*l.*, or 1 ton of the mixed superphosphate and nitrate of soda will cost 7*l.* 8*s.*, or 1*l.* 2*s.* less per ton than the wheat-manure, and will be rather the better manure of the two.

As usual, a number of samples of water, which were sent to me for examination, I found contaminated more or less with house-drainage or injurious products of the decomposition of animal matters, and in some cases they were totally unfit for drinking purposes.

Most of the 35 soils which were sent to me for examination were sent for full analysis and report. Judging from the increasing applications for this laborious and time-consuming analysis, occupying the analyst's time for fully a fortnight, my

reports appear to be duly appreciated, as the following quotation from a correspondent's letter shows:—"I am obliged to you for your clear and instructive report upon the soil sent to you. You have, I think, formed a very just idea of its quality and capability."

With regard to the examinations for poisons, amounting to 14 in the past season, I may mention that, in the majority of cases, I failed to detect any mineral or organic poisons capable of being traced by chemical analysis. In one instance, however, I readily found arsenic in the contents of the stomachs of a number of pigs, which died very suddenly and were suspected of having been poisoned. In another case I detected the presence of castor-oil beans in a compound feeding-cake, which had done serious mischief to sheep and cattle. It is remarkable that, whilst the oil contained in castor-oil beans is only a mild purgative, the expressed seeds are extremely poisonous; a single bean taken internally by an adult person causes vomiting, violent purging, and all the symptoms of a powerful drastic poison.

In former Reports, I have repeatedly directed attention to the danger of giving sheep or cattle stale and mouldy feeding-cakes, which cakes, I have every reason to believe, are in some cases positively poisonous, as pointed out over and over again in my periodical reports.

Notwithstanding the repeated warnings not to give stale mouldy cakes and corn to stock, not a season passes in which I do not receive for examination half-a-dozen or more such cakes, which are alleged to have killed or seriously injured the health of sheep or oxen, and in which no ordinary mineral or organic poison can be detected by analysis.

Only a few weeks ago a striking instance of the great danger of feeding stock even upon small quantities of mouldy cakes, was brought under my notice.

A member of the Society last month sent me a sample of a compound feeding-cake, which was offered to him at 5*l.* 13*s.* 4*d.* per ton, carriage paid.

The sample was in a fairly good condition, but not over fresh, and on analysis was found to have the following composition:—

Composition of a Sample of Compound Feeding-cake.

Moisture	8·25
Oil	6·80
*Albuminous compounds	25·06
Sugar, starch, and digestible fibre	38·79
Woody fibre	8·93
Mineral matter (ash)	12·17
	100·00
* Containing nitrogen	4.01

On examination, I found in the cake, locust beans, linseed-cake, and farinaceous meals, such as Indian corn and rice-meal. My report was to the effect that the cake was decidedly cheap at 5*l.* 13*s.* 4*d.* per ton, delivered. Indeed, the low price struck me as rather a suspicious circumstance, suggesting to my mind that possibly the bulk of the cake might not turn out so good as the sample which was sent to me for analysis, and I accordingly wrote to the sender of the cake to be sure to stipulate, when giving an order for the cake, that its condition should be good. At the same time, I cautioned him not to give the cake to sheep or lambs, if it should be delivered in a stale or mouldy condition, for I know, from past experience, that compound feeding-cakes, into which are incorporated damaged feeding meals, which cannot be sold separately, are very liable to become mouldy, and in this state are positively injurious to animals.

My suspicion was well founded, for the bulk, on delivery, was very different from the sample by which it was sold. Some of the cake, taken from three or four bags, was sent to me for examination, and I had to report that it was mouldy and quite unfit for feeding purposes. Some of the pieces of cake, sent to me for examination, contained maggots and beetles, and all were more or less mouldy. I advised my correspondent to return the cake at the expense of the seller, and not to use any of it for feeding purposes.

After a lapse of 10 days, I received the following note, which does not require any comment from me.

Compound Cake.

"Dear Sir, "November, 1878.

"I write to give you the conclusion of this matter. I sent your letter to Messrs. ———, and offered to return the cake, they to pay all cost of carriage, or, as it contained 4 per cent. of nitrogen, to give 3*l.* for it as manure.

"They replied that the sample was a fair one when taken, but that they found the bulk had got much worse lately. They were willing to take the 3*l.* for it, and amply apologised for the trouble they had given me. Unfortunately, pending your reply, I had given my sheep about 5 ounces each daily, and two had died of irritation of the coat of the stomach."

Under the name of Black Sea rape-cake, cakes are sold which are not genuine, but which consist largely of the siftings from foul linseed and other oleaginous seeds. Frequently, so-called Black Sea rape-cake contains little rape-seed, but a large proportion of dirt, and a great variety of weed-seeds, which occur in the siftings from linseed and other oily seeds.

The following Analysis represents the Composition of a Sample of so-called Black Sea Rape-cake.

Moisture	2·59
*Organic matter	76·46
Phosphates of lime and iron	3·55
†Alkaline salts and magnesia	3·30
Insoluble siliceous matter (sand)	7·10
	100·00
* Containing nitrogen	4·63
Equal to ammonia	5·62
† Containing phosphoric and	·61
Equal to tribasic phosphate of lime	1·33

I need hardly say that such a cake is unfit for feeding purposes; and unless the weed-seeds, of which this cake mainly consists, have been purposely killed, it would not be desirable to use the cake for manuring purposes.

A cake which is almost exclusively used for adulterating linseed-cake, and seldom sold to farmers, is sesamé-cake, a sample of which was analysed by me, with the following results:

Composition of a Sample of Sesamé-cake (Marseilles make).

Moisture	10·05
Oil	8·53
*Albuminous compounds	38·25
Mucilage, sugar, and digestible fibre	24·23
Woody fibre (cellulose)	5·98
†Mineral matter (ash)	12·96
	100·00
* Containing nitrogen	6·12
† Including sand	3·23

Sesamé-cake, it will be seen, is rich in albuminoids, and when less hard pressed than the sample analysed by me, and made from cleaner seed, is a good and wholesome feeding-cake.

In some places the common bracken (*Pteris aquillina*) is so abundant, that it may be cut up and used instead of straw or litter. Its fertilizing properties are superior to those of wheat-, or barley-, or oat-straw, as will be seen by the following analysis which I made some time ago.

Composition of Bracken.

Moisture	6·65
Oil	4·70
*Albuminous compounds	12·13
Mucilage, gum, digestible fibre, &c.	46·84
Woody fibre (cellulose)	24·43
Mineral matter (ash)	5·25
	100·00
* Containing nitrogen	1·94

The superintendence of the Woburn field and feeding experiments has occupied much of my time and attention during the year; since last April, I have paid 13 visits to the experimental field and Crawley Mill farm.

The following are the papers which I have contributed to the 'Journal of the Royal Agricultural Society' for 1878.

1. On Bats' Guano.
2. Annual Report for 1877.
3. Joint Report with Mr. Lawes on the field and feeding experiments at Woburn.
4. The Influence of Chemical Discoveries on the Progress of English Agriculture.

Analyses made for Members of the Royal Agricultural Society from December 1877 *to December* 1878.

Superphosphates, dissolved bones, and compound artificial manures	181
Bone-dust	41
Guanos	75
Nitrate of soda	43
Potash-salts	4
Sulphate of ammonia	6
Refuse manures	37
Limestones, marls, and other minerals	23
Soils	35
Waters	52
Oilcakes	188
Feeding meals	15
Vegetable productions	10
Examinations for poison	14
	724

XV.—*Annual Report of the Consulting Botanist for* 1878.

By W. Carruthers, F.R.S.

The samples of seeds which have been examined by me during the past year have been, on the whole, satisfactory. The worst that passed through my hands were samples of permanent grass, several of which were extremely bad from the admixture of worthless and injurious weeds, and from the quantity of husks, fragments of straw, and other impurities. Though the reports on these specimens saved the members of the Society who submitted them for examination from imposition, and led to arrangements with the dealers which were satisfactory to them individually, I failed to secure advantage to the Society at large, in consequence of the refusal of members to communicate the names of the dealers. It is to be hoped that in future the

members of the Society who send samples of seed to be tested will not hesitate to furnish such information as may lead to the prevention of the adulteration and killing of seeds.

Information has been supplied by me to members as to the nature of the weeds infesting their ground, and the best means of eradicating them; the treatment of different soils in relation to the life of the plants cultivated on them; the character of the permanent pastures fitted for particular soils: and other subjects.

My attention has been directed to the subject of improving our cultivated cereals; and after the following Report was submitted to the Committee, proposals were adopted for offering prizes for new varieties of seed which have been approved by the Council:—

"Changes in plants are due to—

"1. *Soil, food, climate*, &c. Such changes belong to the individual plant, and are not transmitted to its descendants.

"*Sports*, which arise without any apparent cause, and which are handed down to a larger or smaller number of the plant's descendants.

"3. *Cross-breeding*, whereby more or less of the peculiarities of both parents are found in the descendants. Cross-breeding may be of three kinds—(*a*) of individuals of the same species, and this may be either natural, as in the case of plants which are actually or practically unisexual, or artificial, when man interferes and applies the pollen of one individual to the stigma of another; (*b*) of permanent varieties of the same species, as in cultivated plants; and (*c*) of different species of the same genus.

"New varieties require to be tested by cultivation. Some of the descendants lose the character for which the variety is prized, and revert to the original stock; while others retain these qualities, and in some they may become intensified.

"It is necessary to select the seed after each harvesting, in order to secure a uniform and permanent variety. Time is thus necessary to the production of a new variety. A variety secured by experiment in 1879 should be sown by the person who secures it for at least three years; that is, during 1880, 1881, and 1882, in order to establish its permanency, to get rid of the parent forms that may appear, and to secure a certain amount of seed. The seed might be sent after the harvest of 1882, and be tested in various localities by the Society in 1883."

The alarm created in 1877 by the threatened appearance of the Colorado beetle happily did not show itself during the past year. This was no doubt largely due to the action of the Society in distributing so extensively accurate information and

coloured figures of the beetle. The inquiries during the year in relation to insects referred chiefly to the root-eating larvæ of click beetles (wire-worms), and of the daddy long-legs, which are incorrectly called wire-worms. These latter were extremely abundant in some districts of England and Ireland during the past summer, and proved most injurious to the crops. Information was supplied to the members in reference to these and other insect pests by the experienced entomologist who has undertaken this department.

ADDITIONS TO THE LIBRARY IN 1878.

I.—PERIODICALS PRESENTED TO THE SOCIETY'S LIBRARY.

Presented by the respective Societies and Editors.

A.—English, American, and Colonial Periodicals.

Agricultural Economist. Vol. IX. 1878.
———— Gazette, Nos. 209–261. 1878.
———— ———- Almanack. 1879.
American Agriculturist. Vol. XXXVII. 1878.
Athenæum (Journal). Nos. 2618–2670. 1878.

Bath and West of England Society, Journal of the. Vol. X. 1878.
Bell's Weekly Messenger. 1878.
Bristol Mercury. Vol. XC. 1878.
Bussey Institution, Bulletin of the. Vol. III. Part II. 1878.

Chamber of Agriculture Journal. Vol. XIX. 1878.
Coates's Herd Book. Vol. XXIV. 1878.
Country Gentleman's Magazine. 1878.

Dairyman. Vol. II. 1878.

Economist. Vol. XXXVI. 1878.
Essex Standard. Vol. XLVIII. 1878.

Farmer. Vols. XXX. and XXXI. 1878.
Farmer's and Gardener's Almanack. 1879.
———- Herald. Vol. XXVI. 1878.
Field. Vols. LI. and LII. 1878.

Geological Society, Journal of the. Vol. XXXIV. 1878.

Highland and Agricultural Society of Scotland, Transactions of the. Vol. X. 1878.
Indian Agriculturist. Vol. III. 1878.

Institution of Civil Engineers, Proceedings of the. Vols. LI.–LIV. 1877–78.
———— of Mechanical Engineers, Proceedings of the. 1878.
———— of Surveyors, Transactions of the. Vol. X. 1878.
Investor's Monthly Manual. Vol. VIII. 1878.
Irish Farmer's Gazette. Vol. XXXVII. 1878.
Ironmonger. Vol. XX. 1878.

Live-Stock Journal. Vols. VII. and VIII. 1878.

Madras Presidency. Annual Report of the Superintendent of Government Farms. 1877.
Mark Lane Express and Agricultural Journal. Vol. XLVII. 1878.
Massachusetts, Agriculture of, 1877–78.
Meteorological Society, Quarterly Journal of the. Vol. IV. 1878.
Midland Counties' Herald. Vol. XLII. 1878.

Nature. Vols. XVII. and XVIII. 1878.
Newcastle Courant. 1878.
North British Agriculturist. Vol. XXX. 1878.
Nova Scotia Journal of Agriculture. Vol. II. 1878.

Ohio. Thirty-first Annual Report of the State Board of Agriculture for the year 1876.

Quebec, province of. Report of the Commissioner of Agriculture and Public Works. 1876–7.

Red Polled Herd Book. Vol. I. 1877.
Royal Asiatic Society, Journal of the Bombay Branch. No. 35. 1878.
Royal Geographical Society, Journal of the. Vol. XLVII. 1878.
————————, Proceedings of the. Vol. XXII. 1878.
Royal Institution of Great Britain. Vol. VIII. Part IV. 1878.
Royal United Service Institution, Journal of the. Vol. XXII. 1878.

Smithsonian Institution. Contributions to Knowledge. Vol. XXIII. 1878.
Society of Arts, Journal of the. Vol. XXVI. 1878.
Statistical Society, Journal of the. Vol. XLI. Parts I.–IV. 1878.

Tasmania, Statistics of the Colony of. 1877.

Veterinarian, The. Vol. LI. 1878.

Washington. Report of the Commissioner of Agriculture. 1877.
————. Report upon Forestry. 1877.

List of Foreign Periodicals.

Berlin. Landwirthschaftliche Jahrbücher. Band VII. 1878.
———. Landwirthschaftliche Verwaltung. 1875, 1876, 1877.
———. Journal für Landwirthschaft. 1878. Hefte 2 and 3.
Heidelberg. Verhandlungen des Naturhistorisch-Medicinischen Vereins. 1878–1879.
Lima. Revista de Agricultura. 1877.
Lisbon. Historia dos Estabelecimentos Scientificos Litterarios e Artisticos de Portugal. 4 Volumes. 1874–1878.
———. Jornal de Sciencias Mathematicas physicas e Naturaes. 1878.
———. O Agricultor do Norte de Portugal. Vol. II. No. II. 1878.
Montevideo. Boletin Oficial de la Comision Central de Agricultura del Uruguay. 9 Monthly Parts for 1878.
Munich. Landwirthschaftliche Verein in Bayern. Zeitschrift. 1877.

Paris. Annales Agronomiques. Tome quatrième. Fasc. 1–4. 1878.
——. Revue des Industries Chimiques et Agricoles. 1878.
——. Revue Agricole, Industrielle, Littéraire et Artistique. March and April, 1878.
Rome. Annali di Agricoltura. 6 Parts. 1878.
Valencia. Revista Mensual de la Sociedad de Agricultura. Vol. XV. No. I. April, 1878.

II.—BOOKS PRESENTED TO THE SOCIETY'S LIBRARY.

Names of Donors in Italics.

A. English, American, and Colonial Books and Pamphlets.

Dunmore, Earl of. Clydesdale Herd Book. 1878.
Gibson, J. Agriculture in Wales.
Murray, Gilbert. Notes on Dairy Farming.
Peacock, Captain George. On the Supply of Nitrate of Soda and Guano from Peru.
Scott, John. The Farm Valuer.
Streeter, Edwin W. Gold.

B. Foreign Books and Pamphlets.

Buenos Aires. Sociedad rural Argentina. Collection of Photographs. 1876.
Munich. Landwirthschafts-Kalender. 1878. (Presented by the Royal Bavarian Society.)
Paris. Annuaire Statistique de la France. 1878. (Presented by the French Minister of Agriculture and Commerce.)
——. L'Agriculture de l'Angleterre (Translated from the Memoir of British Agriculture, by F. R. de la Trehonnais). 1878. (Presented by the Sociètè des Agriculteurs de France.)
——. Nouvelle Méthode de Statistique Agricole. *J. Laverrière.* 1878. (Presented by the Société Nationale d'Agriculture de France.)
——. Rapport sur le Congres Agricole International à l'Exposition de 1878 à Paris. 1878.
Rome. Le Lane Italiane alla Esposizione di Parigi nel 1878. (Presented by the Italian Minister of Agriculture and Commerce.)
——. L'Italia Agraria e forestale. 1878.

CATALOGUE OF BOOKS AND PAMPHLETS

IN THE

LIBRARY

OF THE

Royal Agricultural Society of England,

DECEMBER 31ST, 1877.

Aarsberetning anagaaende de offentlige Foranstaltninger til Landbrugets. Christiania, 1876.
Abou Bekr Ibn Bedr. Le Nacérî. La Perfection des deux Arts, ou traité complet d'Hippologie et de Hippiatrie Arabes. Traduit de l'Arabe par M. Perron. Paris, 1852.
Academia Real Economico Agraria di Firenze. Atte. Firenze, 1875.
Academia Real das Sciencas de Lisboa. Catalogo das Publicaçoes. Lisbon, 1865.
———, Journal. 3 Vols. Lisbon, 1864–1870.
———, Memorias. 10 Vols. Lisbon, 1854–1871.
Académie des Sciences, Arts, et Belles-Lettres de Dijon. Mémoires. 2 Vols. Dijon, 1841.
Academy of Science of St. Louis. Transactions. St. Louis, U.S.A., 1858.
Accum, F. Chemistry. 2 Vols. London, 1803.
———. Analysis of Minerals. London, 1804.
Acland, T. D. Meat, Milk, and Wheat. London, 1857.
———. The Education of the Farmer. London, 1857.
Acton, Eliza. The Bread Book. London, 1857.
Acton, E. B. The Agricultural Holdings Act. London, 1876.
Adams, G. A New System of Agriculture. London, 1808.
Adams, James. Essays on Agriculture. 2 Vols. London, 1789.
Adresse aux vrais hommes de bien. London, 1801.
Aeolus. A Retrospect of the Weather of 1844, and Prognostication for 1845. London, 1845.
Agen, Société d'Agriculture d'. Recueil des Travaux, Agen, 1872.
Agricultural Gazette. 4 Vols. London, 1874–7. (See Gardeners' Chronicle.)
Agricultural and Horticultural Society of India. Transactions. Calcutta, 1839, 1840.
Agricultural Magazine. 20 Vols. London, 1804–1855.
Agricultural Returns for Great Britain. 2 Vols. London, 1867–1876.

Agricultural Students' Gazette. Cirencester, 1876.
Agricultural Surveys of England and Scotland. 71 Vols. London, 1812–1817.
Agriculture Defended. London, 1811.
Agriculture en Irlande et dans la Grande Bretagne. Paris, 1840.
Agriculture Française. 6 Vols. Paris, 1843–1847.
Agriculture, Moniteur de la Propriété et de l'. Paris, 1840.
Agriculture, Moyens de s'enricher par l'. Paris, 1803.
Agriculture, the Theory and Practice of. London, 1803.
Agriculture, the Triumph of. A Poem. London, 1797.
Aikin, A. Address at the Society of Arts. London, 1817.
Ainsworth, R. Dictionary of the Latin Tongue. 2 Vols. London, 1796.
Aiton, Wm. Hortus Kewensis. 3 Vols. London, 1789.
Allen, L. F. The American Herd Book. Buffalo, 1846.
Allen, Wm. The Landlord's Companion ; or, Ways and Means to Raise the Value of Land. London, 1742.
Alpaca, Naturalization of the. London, 1841.
A Maximum ; or, the Rise and Progress of Famine. London, 1801.
American Board of Agriculture. Report. Boston, U.S.A., 1854.
American Institute. Reports. 18 Vols. Albany, U.S.A., 1849–1872.
American Journal of Science and Arts. 5 Vols. New Haven, U.S.A., 1863–1868.
American Pomological Society. Proceedings. Chicago, U.S.A., 1875.
Amery, J. On Keeping Farm Accounts. Stourbridge, 1845.
Anderson and Gisborne. Plans and Descriptions of Single Horse Carts. Manchester, 1795.
Anderson, James. Russian Sheep. Edinburgh, 1794.
———. Drainage of Bogs. London, 1797,
———. Essays on Agriculture. 3 Vols. London, 1800.
———. Recreations in Agriculture. 6 Vols. London, 1799–1806.
Andrewe, Laurence. "The Grete Herball." London, 1527.
Andrewes, G. H. Treatise on Agricultural Engineering. London, 1852.
Annales Agronomiques. 3 Vols. Paris, 1875–1877.
Annales de l'Institut Agronomique. Paris, 1852.
Annesley, A. Strictures on the True Cause of the present alarming Scarcity of Grain. London, 1800.
Anstruther, Sir John. Remarks on Drill Husbandry. London, 1796.
Antidote to Distress. London, 1817.
Aquino, Carlo de. Nomenclator Agriculturæ. Rome, 1736.
Arable Land, Replies (MS.) to Circular Letter from Board of Agriculture respecting the Expenses on. 1814.
Archives de l'Agriculture du Nord de la France. Lille, 1856–1864.
Archivos do Museu Nacional do Rio de Janeiro. Rio de Janeiro, 1876.
Arkansas, Geological Survey of. Philadelphia, 1860.
Arrhenius, J. Institutions Agricoles de la Suède. Stockholm, 1872.
Asbjörnsen, P. Ch. Biographie de Anton Rosing. Christiania, 1869.
Association Française de Bienfaisance. Comité de Secours aux Victimes de la Guerre. Compte rendu. St. Petersburg, 1871.
Athenæum, The. 25 Vols. London, 1853–1877.
Atlas Pecuario de Portugal. Lisbon, 1870.
Augustin Miguel. Libro de los Secretos de Agricultura. Madrid, 1731.
A Word in Season ; or, How to Grow Wheat with Profit. London, 1859.
Aylesby Herd, Catalogue of the. Bred by W. Torr. 1875.

Bacon, R. N. The Agriculture of Norfolk. London, 1844.
Bailey, A. M. 106 Copperplates of Mechanical Machines and Implements of Husbandry. 2 Vols. London, 1782.

Bailey, J. Agriculture of Northumberland. London, 1813.
Bailey, Jno. On the Construction of Ploughs. Newcastle, 1795.
———. Rules for Constructing Ploughs and other Implements of Husbandry. Newcastle, 1810.
Baily, F. On Leases. London, 1807.
Bakewell, R. On Wool. London, 1808.
Bald, A. The Corn-Dealer. Edinburgh, 1780.
Baldwin, J. On the Cultivation and Uses of the Swedish Turnip. Birmingham, 1843.
Ballot, Dr. J. C. Magazijn voor Landbouw en Kruidkunde. Utrecht, 1864–1865.
Bancelin-Dutertre. Agriculture Anglaise. Traduit de l'Anglais de Caird. Paris, 1855.
Banfield, T. C. Organization of Industry. London, 1845.
Banister, J. Synopsis of Husbandry. London, 1799.
Bankes' Library of Agriculture. London, 1851.
Banking System, Abuses of the. Petersburg, U.S., 1841.
Banqueri, J. Antonio. Libro de Agricultura. Translated into Spanish from the Arabic MS. of Ebn-el-Awan. 2 Vols. Madrid, 1802.
Baretti, Giuseppe. Dizionario delli Lingue Italiano ed Inglese. 2 Vols. London, 1798.
Barral, J. A. Drainage des terres Arables. 3 Vols. Paris, 1856.
———. Eloge Biographique de M. le Vicomte de Courval. Paris, 1876.
———. Les Irrigations dans le Département des Bouches du Rhone. Paris, 1876.
———. Statique Chimique des Animaux. Paris, 1850.
Barry, Rev. Dr. History of the Orkney Islands. London, 1808.
Barton, Jno. On the Condition of the Labouring Classes. London, 1817.
Bassett, J. D. On the County Rate. Exeter, 1813.
Bath and West of England Society's Journal. 16 Vols. London, 1853–1868.
———. New Series. 9 Vols. London, 1869–1877.
Bath Society Papers. 14 Vols. Bath, 1786–1810.
Batson, T. How to Improve the Condition of the Agricultural Labourer. London, 1851.
Bawdwen, Rev. W. A Translation of the Domesday Book for York, Derby, Nottingham and Lincoln, and parts of Lancashire, Westmoreland, and Cumberland. Doncaster, 1809.
Baxter, W. H. On the Repeal of the Malt Tax and Brewers' License Duty. London, 1874.
Bayerische Gesetzgebung im Bereiche der Landwirthschaft. Munich, 1862.
Bayerischen Akademie der Wissenschaften. Abhandlungen der Mathematisch-Physikalischen Classe. Munich, 1832.
Bayern, Centralblatt des Landwirthschaftlichen Vereins in. 15 Vols. Munich, 1836–1873.
Bayldon, J. S. Rents and Tillages. London, 1827.
———. On Rents and Tillages. Revised by J. Donaldson. London, 1844.
———. The Art of Valuing Rents and Tillages. By J. Chalmers Morton. Ninth Edition. London, 1876.
Bazley, T. B. Notes on the Horse Sickness at the Cape of Good Hope in 1854–1855. Cape Town, 1856.
Beaufort, D. A. Topography of Ireland. London, 1792.
Beauvain, Chevalier de. Histoire Militaire de Flandre depuis 1690 jusqu'à 1694. 3 Vols. Paris, 1755.
Beazley, S. On the System of Enclosing Waste Lands. London, 1812.
Bechi, E. Comizio Agrario di Firenze. Conferenza di 1872. Firenze, 1872.
Beckett, Joseph. Mensuration. London, 1804.

Becquerel, M. Des Climats et de l'Influence qu'exercent les sols boisés et non boisés. Paris, 1853.
———. Engrais Inorganiques. Paris, 1848.
Beever, W. H. Notes on Fields and Cattle. London, 1862.
Behmer, R. Das Landwirthschaftliche Prämürungswesen von Thieren und Maschinen. Berlin, 1877.
Belgien, Onderrigting voor de opkweeking der Peerden in. Brussels.
Bell, A. On the Prohibition of the Use of Grain in Distilleries. Edinburgh, 1808.
Bell, Anthony. Agriculture of the Isle of Wight. MS. 1802.
———. Agriculture of Hampshire. MS. 1804.
Bell, Benjamin. Essays on Agriculture. Edinburgh, 1802.
Bell, R. On Leases. Edinburgh, 1805.
Bell, W. On the Cause and Effect of Populousness. Cambridge, 1756.
Bell's Messenger. 28 Vols. London, 1839–1877.
Bengal, Husbandry of. Calcutta, 1804.
Bennison's Survey of Liverpool and Environs.
Beretning om det Köngl. Selskab for Norges Vel. Christiania, 1875.
Beretnings om Ladegaardsoens Hovedgaard. 3 Vols. Christiania, 1862–1875.
Berkenhont, J. Botanical Lexicon. London, 1789.
———. Natural History of Great Britain. 2 Vols. London, 1795.
Bernard, Sir T., Bart. On Employment for the Labouring Classes. London, 1817.
———. The Repeal of the Salt Duties. London, 1817.
Bernays, A. J. The Theory of Agriculture. Manchester, 1844.
Berthollet, C. L. Chemical Affinity. Translated from the French, by M. Farrell. London, 1804.
Bertrand, M. Eléments d'Agriculture. Berne, 1775.
Bidrag til Bygningskkens Udvikling paa Landet i Norge. Christiania, 1865.
Biographies des Membres de la Société Impériale et Centrale d'Agriculture de France, 1848–1853. Paris, 1865.
Birch, J. Examples of Labourers' Cottages. London, 1871.
Bischoff, James. Wool, Woollen, and Sheep. 2 Vols. London, 1842.
Black, J. Lectures on the Elements of Chemistry. 2 Vols. Edinburgh, 1803.
———. Observations on the Tillage of the Earth. London, 1777.
Blacker, W. Free Trade, Unjust in Principle, &c. London, 1850.
———. High Taxation, Remarks on. London, 1850.
———. Protecting Duty, Remarks on. London, 1850.
———. On the Improved Cultivation of Small Farms. Dublin, 1837.
———. On the Labouring Classes of Ireland. London, 1846.
Blackstone, Sir Wm. Commentaries on the Laws of England. 4 Vols. London, 1800.
Blaikie, F. On the Conversion of Arable Land into Pasture. Burnham, 1817.
———. On the Planting and Management of Forest Trees. London, 1810.
Bland, W. The Principles of Agriculture. London, 1827.
———. Ditto. London, 1864.
Blurton, W. On Steam Ploughing. Birmingham, 1840.
Blytt, A. Christiania Omegns Phanerogamer og Bregner. Christiania, 1870.
Boardman, Thos. Dictionary of the Veterinary Art. London, 1805.
Bocage, J. F. B. Peixos Plagiostomos. Lisbon, 1876.
Bombay Branch of Royal Asiatic Society, Journal of the. Bombay, 1874.
Bombay Magnetical and Meteorological Observations. 5 Vols. Byculla, 1859–1863.
Bompass, C. C. Heat, Light, and Electricity. London, 1817.

Bond, R. Suffolk Prize Cottages. Ipswich, 1867.
Bordley, J. B. Essays and Notes on Husbandry. Philadelphia, 1799.
Bortier, P. Méthode nouvelle pour la Culture de la Pomme de Terre. Brussels, 1877.
———. Papier d'Aubier de tremble. Brussels, 1877.
Boston (U.S.) Society of Natural History, Annual of. Boston, 1868.
———. Journal of. Boston, 1863.
———. Proceedings of. Boston, 1864–1868.
Botanic Garden. A Poem. 2 Vols. London, 1799.
Bouchard, Louis. Traité des Constructions rurales. Paris, 1858.
Bouchardat, M. Du Lait. Paris, 1857.
Boussingault, J. B. Economie Rurale. 2 Vols. Paris, 1851.
———. Rural Economy. London, 1845.
Bowes, P. Farm Book-Keeping. 5 Vols. London, 1853.
Boyer, A. Dictionnaire Royal. Français-Anglais et Anglais-Français. 2 Vols. London, 1796.
Brabazon, W. The Deep Sea and Coast Fisheries of Ireland. Dublin, 1848.
Bradley, R. Science of Good Husbandry. London, 1727.
———. Treatise on Agriculture. London, 1757.
Brand, J. A Determination of the Average Depression of the Price of Wheat in War. London, 1800.
Bread. A Temperate Discussion of the Causes which have led to the present High Price of Bread. London, 1800.
———. To Labourers and Housekeepers, on Savings in Bread. London, 1795.
Brewer, George. The Rights of the Poor considered, with the Causes and Effects of Monopoly. London, 1800.
Briggs, H. On Growing Wheat and other Crops. Wakefield, 1843.
———. On Lime and its uses in Agriculture. London, 1845.
Brisson's Chemistry. London, 1801.
Bristed, John. America and her Resources. London, 1818.
British American Cultivator, The. Toronto, 1842.
British Farmer's Annual Account Book. London, 1840.
British Farmer's Magazine. London, 1841–1843.
British Husbandry. London, 1834.
British Wool and Live Sheep, a general View of the Bill for Preventing the Illicit Exportation of. London, 1787.
Brooke, W. The True Causes of our present Distress for Provisions. London, 1800.
Brotherton, W. The Olive, Rape, and Flax. London, 1857.
Brougham, Henry. Speech of, on the State of the Nation. London, 1817.
Brown, G. On Draining. Macclesfield, 1841.
———. On Draining. London, 1846.
———. Practical Observations on Land Draining, &c. Macclesfield, 1850.
Brown, James. The Forester. Edinburgh, 1851.
Brown, Lieut. On Fumigating Horticultural and Agricultural Crops. London, 1851.
Brown, R. Agricultural and Rural Affairs, 2 Vols. Edinburgh, 1811.
Brown, W. Farmer's Annual Account Book. London, 1856.
Brown, Wm. British Sheep Farming. Edinburgh, 1870.
Bruce, A. Report on the Infectious and Contagious Diseases in Stock prevailing in Europe. Sydney, N.S.W., 1874.
Bryant, C. Flora Diatetica. London, 1783.
Bryas, Ch. de. Exposé des Travaux de Drainage. Paris, 1855.
Buchanan, R. Economy of Fuel. Glasgow, 1810.
Bund, J. W. W. The Law of Compensation for Unexhausted Improvements. London, 1876.

Burat, A. Applications de la Géologie à l'Agriculture. Paris, 1872.
Burges, G. Native Guano, the best Antidote against the Future Fatal Effects of Free Trade in Corn. London, 1848.
Burgoyne, M. On Public Affairs. London, 1808.
Burn, R. Scott. Outlines of Modern Farming. 3 Vols. London, 1872.
Burnett, A. Tull's Method of Farming. London, 1859.
Butchers' Meat, the High Prices of. London, 1796.
Butré, M. de. Loix Naturelles de l'Agriculture et de l'Ordre Social. Neuchatel, 1781.

Caird, James. English Agriculture. London, 1852.
———. Prairie Farming. London, 1859.
Caird, J. A. K. Notes on Sheep Farming in New Zealand. London, 1874.
Calvert, J. W. The Merits and Tendencies of Free Trade and Protection. London, 1850.
Campbell, A. Tour in Scotland. 2 Vols. London, 1802.
Campbell, J. Political Survey of Great Britain. 2 Vols. London, 1774.
Canadian Agricultural Journal. Nos. 8–10. Montreal, 1844.
Canning, George. Speech of, on the motion for an Address to the Prince Regent. London, 1817.
———. Speech of, on the motion for a Censure on his Embassy to Lisbon. London, 1817.
Capello, F. de B. Peixos Plagiostomos. Lisbon, 1866.
Cardigan Agricultural Society. Rules and Premiums for the Year 1794. Carmarthen, 1794.
Carlisle, N. Topographical Dictionary of England. 4 Vols. London, 1808.
Carotte, Instruction sur la Culture de la. Paris.
Carr, J. S. The Sheep Pox: its Causes, Symptoms, Prevention, and Cure. London, 1847.
Catalogue of the Special Loan Collection of Scientific Apparatus at South Kensington Museum. London, 1877.
Cattle: their Breed, Management, and Diseases. London, 1834.
Cause and Cure. Letters to the Government and the People. London, 1817.
Cavour, G. B. Relazione al Ministro d'Agricoltura de Regii Commissarii presso l'Esposizione Internazionale del 1862. London, 1862.
Censimento Generale dei Cavalli e dei Muli. 2 Vols. Rome, 1876.
Chadwick, E. Metropolitan Sewers. London, 1849.
———. Suburban and Land Drainage. London, 1849.
Chalmers, Thomas. National Resources. Edinburgh, 1811.
Chamber of Commerce. Report of the Committee on the Bill for Regulating the Importation and Exportation of Corn. Glasgow, 1800.
Chamber of Commerce, Jamaica. Report of. London, 1847.
Chaptel, M. J. A. Elements of Chemistry. 3 Vols. London, 1800.
Chateauneuf, Benoiton de. Review of his Memoir "Sur l'Extinction des Familles Nobles en France." London, 1848.
Chateauvieux, M. Italy, its Agriculture. Translated by M. O. Rigby. Norwich, 1819.
Chauveau, A. The Comparative Anatomy of the Domesticated Animals. Translated and Edited by George Fleming. London, 1873.
Cheap and Good Husbandry. London, 1631.
Cheap Manure by Burning Clay. York, 1817.
Chemico-Agricultural Society of Ulster. Report of the. Belfast, 1849.
Cherry, F. C. On Queen's Plates and the Breeding of Horses as Farming Stock. London, 1847.
Cheval, Instruction pour l'Élève du, en Belgique. Brussels.
Christchurch Agricultural Society. Rules and Orders. Salisbury, 1807.

Church, A. H. The Laboratory Guide. London, 1844.
Church Property and Tythes. London, 1815.
Chylinski, Dobrogost. The Beekeeper's Manual. London, 1845.
Claridge, J. Shepherd of Banbury's Rules to Judge of the Changes of the Weather. Banbury, 1781.
———. Shepherd of Banbury's Weather Rules. London, 1827.
Clarke, Cuthbert. Theory of Husbandry. London, 1777.
———. Treatise on Gypsum. London, 1792.
Clarkson, W. On Pauperism and Poor Rates. London, 1815.
Clater, F. Every Man his own Cattle-Doctor. London, 1810.
———. Every Man his own Farrier. London, 1809.
Claussen, Chevalier. The Flax Movement. London, 1851.
Coates' Herd Book. 23 Vols. London, 1835–1877.
Coatsworth, D. Hints on Husbandry. Stockton, 1806.
Cobbett, William. A Year's Residence in the United States of America. London, 1818.
———. Papers against Gold. London, 1812.
Cobbold, T. S. Our Knowledge respecting Entozoa. London, 1865.
———. The Internal Parasites of our Domestic Animals. London, 1873.
Cochrane, Hon. J. The Seaman's Guide, showing how to Live Comfortably at Sea. London, 1797.
Colchester, B. On the Employment of Agricultural Labourers. Ipswich, 1849.
Coleman, E. On the Foot of the Horse. London, 1798.
Colleccion General de los Trages en España. Madrid, 1801.
Collett, R. Rugekasser for vore nyttige Smaafugle, &c. Christiania, 1870.
Collins, C. E. The Life of a Royal Berkshire Dairy Farmer. London, no date.
Collins, David. Account of New South Wales. London, 1804.
Collot, V. Sur la Manière de relever les Chevaux en France. Paris, 1802.
Colman, H. Continental Agriculture. London, 1848.
———. European Agriculture. 2 Vols. London, 1849.
Colquhoun, P. Indigence: with Propositions for Ameliorating the Condition of the Poor. London, 1806.
———. The Wealth, Power, and Resources of the British Empire. London, 1815.
Coltivatore Cuneese. Bollettino del Comizio Agrario de Cuneo. 2 Vols. Cuneo, 1870–1871.
Comber, W. T. On Bank Currency. London, 1817.
Commissioner of Agriculture, Reports of the. 4 Vols. Washington, 1869–1875.
Common and Waste Lands, Proposals for the Improvement of. London, 1723.
Commons and Waste Lands, the Improvement of. London, 1732.
Common Field Lands, The Chief Impediments to Enclosing. London, 1734.
Communications to the Board of Agriculture on subjects relative to the Husbandry and Internal Improvement of the Country. 22 Vols. London, 1797–1811.
Complete Farmer, The; or, General Dictionary of Agriculture and Husbandry. 2 Vols. London. 1807.
Complete Grazier, The. London, 1851.
Compte rendu de la Vente des Laines et des Bêtes á laine du troupeau National. Paris.
Compte rendu relatif à l'enseignement Professional de l'Agriculture. Paris, 1850.

Concalon, Victor. Histoire de l'Agriculture. Limoges, 1857.
Concours d'Animaux de Boucherie. 7 Vols. Paris, 1844–1856.
Concours d'Animaux reproducteurs. 7 Vols. Paris, 1850–1856.
Condition of Farmers in various Counties, Replies (MS.) to the Circular Letter of the Board of Agriculture respecting the. 3 Vols. 1816.
Congrès Central d'Agriculture, Compte rendu des Séances. 6 Vols. Paris, 1844–1849.
Congrès International Agricole tenu à Bordeaux, Compte rendu du. Bordeaux, 1876.
Congressional Directory. Washington, 1871.
Congresso Generale degli Agricoltori Italiani tenusoti in Ferrara, 1875. Atti ufficiali. Milan, 1877.
Connecticut Board of Agriculture. Reports of. 5 Vols. Hartford, U.S.A., 1866–1872.
Constable, John. Agricultural Education. London, 1863.
Cook, G. H. Geology of New Jersey. Newark, U.S.A., 1868.
Cooke, L. Agricultural Tables. London, 1813.
———. The Theory and Practice of Valuing Tithes. London, 1840.
———. The Value of Landed Property. London, 1844.
———. The Value of Estates. London, 1850.
Cork Institution. Annual Report. Cork, 1813–1814.
Corn, Average Price of. 10 Vols. London, 1802–1811.
———, Considerations on the High Price of. Norwich, 1800.
———, National Thought, showing the Damages arising from a Bounty on. London.
———, Observations on the present High Price of. Bristol, 1795.
———, Thoughts of an Old Man of Independent Mind though Dependent Fortune on the present High Price of. London, 1800.
Corn Bill, Observations on the. By an Essex Farmer. London, 1793.
Corn Trade, Certain Commercial Principles in their application to the. London, 1800.
———, Sentiments of a Corn Factor on the present Situation of the. London, 1758.
Corn Trade and Corn Laws, A Compendium of the. London, 1757.
———, An Essay on the. London, 1758.
Corne, The New and Admirable Arte of Setting of. London, 1600.
Correspondent. No. 1.
Corrigan, Andrew. Theory and Practice of Modern Agriculture. Dublin, 1858.
Cort, R. On Making Cheap Salt from Sea Water. London, 1838.
Corvo, J. de A. Estudos Economicos e Hygienicos sobre os Arroyars. Lisbon, 1860.
———. Tabella geral do Estudo Agronomico. Lisbon, 1860.
——— Tabella geral do Estudo Chimico. Lisbon, 1860.
Coste, M. Instructions pratique sur la Pisciculture. Paris, 1853.
Cottage Improvement Society. Original Plans. London, 1861.
———. Report of Committee. London, 1842.
Cottam and Hallen's Catalogue of Agricultural Implements, Machines, &c. London, 1846.
Coulter, J. M. Synopsis of the Flora of Colorado. Washington, 1874.
Country Gentleman's Magazine. 13 Vols. London, 1868–1876.
Court of Common Council. Report of Committee respecting the causes of the High Prices of Provisions. London, 1876.
Courtenay, T. P. On the Poor Laws. London, 1818.
Couteaux, Gustave le. Vacherie Nationale du Pin. Paris, 1855.
Coutinho, J. D. de A. Ensaio economico sobre o Commercio de Portugal. Lisbon, 1828.

Cove, M. An Inquiry into the Necessity, Justice, and Policy of a Commutation of Tithes. Hereford, 1800.
Cowie, Rev. M. Letter to the Duke of Buccleuch on the Education at Putney College. London, 1849.
Cowper, John. An Essay on Inclosing Commons, &c. London, 1732.
Cox, A. Landlord's and Tenant's Guide. London, 1855.
Cox, E. T. Geological Survey of Indiana. Indianopolis, U.S.A., 1872.
Cox, George. Agricultural Chemistry. London, 1844.
Coxons, T. On Agriculture and Grazing. London, 1837.
Coxworthy, F. Electrical Condition applied to Facts connected with Heat, the Atmosphere, Agriculture, &c. London, 1848.
Craufurd, Lieut.-General. On Circulating Medium, Currency, &c. London, 1817.
———. On the Poor Laws. London, 1817.
———. On the State of the Country since the Peace. London, 1817.
Cresentius, Petrus de. Civis Bononiensis Ruralium Commodorum. Date about 1486.
Crewe, C. H. On Agricultural Interests. Derby, 1845.
Crisp, E. Lamb Disease. London, 1863.
Crosskill's Implement Newspaper. Beverley, 1848.
Cruickshank, A. Annual List of Shorthorned Breeding Stock. Aberdeen, 1848.
Crumpe, S. Employment for the People. London, 1795.
Crumpton, J. Farmer's Account Book. Shrewsbury. 1843.
Culley, G. Agriculture of Northumberland. London, 1813.
———. Live Stock. London, 1794.
Cultivation of the Sugar Cane. Spanish Town, Jamaica, 1843.
Curley, E. A. Nebraska: Its Advantages, Resources, and Drawbacks. London, 1875.
Curry, James. On the High Price of Grain. London, 1815.
Curtis, William. Flora Londinensis. 2 Vols. London. 1777.
———. On the Operations of the New Corn Bill. Lynn, 1804.
———. Practical Observations on the British Grasses. London, 1798.
Curwen, J. C. Letters from Ireland. 2 Vols. London, 1818.
———. On Friendly Societies. London, 1817.

Dahl, F. A. Om Törkehus for Korn. Christiania, 1867.
Dalrymple, W. A Treatise on the Culture of Wheat. London, 1801.
Dalton, J. Meteorological Observations. Manchester, 1834.
———. Microcosmic Salt. Manchester, 1840.
———. New System of Chemistry. 3 Vols. Manchester, 1810.
Dana, J. D. System of Mineralogy. New York, 1850.
Dana, S. L. On Manures. Boston, U.S., 1843.
Danish and English Dictionary. Leipzig, 1869.
Darwin, E. Phytologia; or, the Philosophy of Agriculture and Gardening. London, 1800.
Daubeney, C. On Climate. Oxford, 1863.
———. On Institutions for the Better Education of the Farming Classes. London, 1850.
———. On the Rotation of Crops. London, 1845.
———. Roman Husbandry. Oxford, 1857.
Davenport, E. D. How to Improve the Condition of the Working Classes. London, 1845.
Davis, Hewitt. Essays on Farming. London, 1850.
———. Practical Essays on the Improvement of Farming. London.
Davison, John. On the Poor Laws. Oxford, 1817.

Davy, Sir Humphrey. Elements of Agricultural Chemistry. London, 1813.
———. On the Plan for Improving the Royal Institution. London, 1810.
Davy, J. T. Herd Book of Devon Cattle. 5 Vols. London, 1854–75.
Dean, G. A. The Culture, Management, and Improvement of Landed Estates. London, 1872.
———. The Landed Steward. London, 1851.
Dean, J. The Employment of the Working Classes. London, 1845.
De Commerell, M. l'Abbé. Mémoire sur l'Amélioration de l'Agriculture par la suppression des Jachères. Paris.
Delondre, A. Bombardement du Muséum d'Histoire Naturelle de Paris par l'Armée Allemande en 1871. Paris, 1871.
———. Enseignement de la Sériculture dans L'Empire Austro-Hongrois. Paris, 1871.
Deman, E. F. Flax, its Cultivation and Management. London, 1851.
Denton, J. Bailey. Draining Tables. London, 1861.
———. General Drainage and Distribution of Water. London, 1842.
———. Land Drainage. London, 1861.
———. Model Mapping. London, 1841.
———. The Farm Homesteads of England. London, 1864.
Department of Agriculture. Monthly Reports. 12. Vols. Washington, 1863–1876.
De Re Rustica; or, The Repository. London, 1769.
Deutsch, D. L. Kurze Anweisung zur Maulbeerbaum-Zucht. Berlin, 1830.
Devincenzi, G. Relazione al Ministro d'Agricoltura dei Regii Commissarii presso l'Esposizione Internazionale del 1862. London, 1862.
D'Evires, J. C. F. De la Stabulation permanente. Lyon, 1834.
Deyeux, N. Expériences de Lait. Strasbourg, 1803.
D'Hervey-Saint-Denys, Baron L. Recherches sur l'Agriculture et Horticulture des Chinois. Paris.
Dickson, A. Husbandry of the Ancients. 2 Vols. Edinburgh, 1788.
———. Treatise on Agriculture. 2 Vols. Edinburgh, 1769.
Dickson, J. H. Cultivation and Manufacture of Flax. London, 1846.
Dickson, R. W. Practical Agriculture. 2 Vols. London, 1805.
Dictionary. Danish and English. Leipzig, 1869.
———. English (Dr. Johnson's). 2 Vols. London, 1797.
———. English and Danish. Leipzig, 1869.
———. English and French (Boyer's). London, 1796.
———. English and French (Spiers'). 2 Vols. Paris, 1872.
———. English and German (Lucas'). 2 Vols. Bremen, 1856.
———. English and Italian (Baretti's). 2 Vols. London, 1798.
———. English and Latin (Ainsworth's). London, 1796.
———. English and Swedish. Leipzig, 1869.
———. French and English (Boyer's). London, 1796.
———. French and English (Spiers'). 2 Vols. Paris, 1872.
———. German and English (Lucas'). 2 Vols. Bremen, 1856.
———. Italian and English (Baretti's). London, 1798.
———. Latin and English (Ainsworth's). London, 1796.
———. Swedish and English. Leipzig, 1869.
Dictionnaire universel d'Agriculture et de Jardinage. 2 Vols. Paris, 1751.
Die königliche Würtembergische Lehranstalt für Land- und Forstwirthschaft in Hohenheim. Stuttgart, 1842.
Dillon, J. T. An Essay on Foreign Agriculture. London, 1796.
Diseases of Cattle, Reports of the Commissioner of Agriculture on the. 2 Vols. Washington, 1869–1871.
Dirom, A. An Inquiry into the Corn Laws. Edinburgh, 1796.

Dix, W. On the Utility of a Newly-invented Patent Machine for Clearing Grain from the Straw instead of Thrashing it with the Flail. London, 1797.
Dixon, Rev. E. S. Ornamental and Domestic Poultry. London, 1850.
Dobbs, J. Description of Dobbs' Reaping Machine. Shrewsbury, 1815.
Dod and Peeling's Yearly Farmer's Account Book. London, 1846.
Dodd, R. A Short Historical Account of the Principal Canals in the Known World. Newcastle, 1795.
———. On the State of Tynemouth Harbour. Newcastle, 1796.
———. On Various Improvements in the Harbour of Hartlepool. Newcastle, 1795.
———. Report on the First Part of the Line of Inland Navigation from the East to the West Sea by Way of Newcastle and Carlisle. Newcastle, 1795.
Dollond, G. The Atmospheric Recorder. London, 1848.
Domesday Book. A Translation of the, by Rev. W. Bawdwen, for York, Derby, Nottingham, and Lincoln, and parts of Lancashire, Westmoreland, and Cumberland. Doncaster, 1809.
Donald, J. Land Drainage. London, 1851.
Donaldson, J. Bayldon on Rents and Tillages. London, 1844.
———. Manures, Grasses, and Farming. London, 1842.
———. Modern Agriculture. 4 Vols. Edinburgh, 1795.
Donaldson, Professor. Rudimentary Treatise on Clay Lands and Loamy Soils. London, 1852.
Doncaster Agricultural Association. Report of the Committee on Bones as a Manure. London, 1834.
Donovan, E. Natural History of British Insects. 10 Vols. London, 1802.
D'Orgebray, F. M. Traité d'Agriculture. Paris, 1849.
Dossie, R. Memoirs of Agriculture. 3 Vols. London, 1768.
Douglas, H. On Pleuro-Pneumonia. Ulverston, 1849.
Dover, R. British Guano. London, 1848.
Doyle, Martin. Cyclopædia of Practical Husbandry. London, 1843.
Drury, C. New System of Farming. London, 1817.
Dublin Society's Catalogue of Plants in the Botanic Gardens at Glasnevin. Dublin, 1802.
Dublin Society's Essays. Dublin, 1740.
Duckham, T. Eyton's Herd Book of Hereford Cattle. 5 Vols. Hereford, 1862–1876.
Dudley, Rev. H. B. On the State of the Poor. London, 1802.
Dumas, M. Institutions de Crédit Foncier et Agricole de l'Europe. Paris, 1851.
Dun, Finlay. Veterinary Medicines, their actions and uses. Edinburgh, 1874.
Duncan, A. Diseases of Sheep. Edinburgh, 1807.
Duncan, J. On the Potato Plant. Wick, 1847.
Dundonald, Earl of. Treatise on the Connexion between Agriculture and Chemistry. London, 1795.

Ebn-el-Awam. Libro de Agricultura. Translated from the Arabic MS. into Spanish, by Don J. Antonio Banqueri. 2 Vols. Madrid, 1802.
Ecole Vétérinaire de Bruxelles, Compte rendu. Brussels, 1836.
Eden, Sir F. M. State of the Poor; or, History of the Labouring Classes. 3 Vols. London, 1797.
Edmondstone, A. The Zetland Islands. Edinburgh, 1809.
Education in England. Recent Measures for the Promotion of. London, 1839.

Edwards, G. Effectual Means of Providing against the Distress Apprehended from the Scarcity and High Prices of Food. London, 1800.
———. Five Practical Plans for Relieving Present Distresses. Barnard Castle, 1820.
Ellerman, C. F. Sanitary Reform and Agricultural Improvement.
Ellis's Husbandry. 2 Vols. London, 1772.
Ellis, D. Atmospheric Air. Edinburgh, 1807.
———. Ditto. Edinburgh, 1811.
Ellis, William. The Farmers' Instructor. London, 1747.
———. The Practical Farmer. London, 1732.
Emersen, G. B. Manual of Agriculture. Boston, U.S., 1862.
Engel, F. Handbuch des Landwirthschaftlichen Bauwesens. Wriezen an O. 1852.
England, a Self-Supporting Country. London, 1848.
England and Scotland, Agricultural Surveys of. 71 Vols. London, 1812–1817.
England and Wales, Geological Map of.
English Agriculture, A Candid Examination of the Pamphlet entitled. London, 1766.
———, An Impartial View of. London, 1786.
——— Dictionary. Dr. Johnson's. 2 Vols. London, 1797.
Encyclopédie Méthodique. Chimie, Pharmacie, et Métallurgie. 3 Vols. Paris, 1786.
Entomological Society. Transactions. 14 Vols. London, 1836–1869.
Essays not Rewarded. MS. On Converting Grass Land into Tillage. 1801. 24 Vols.
Evans, R. On the Best Mode of Keeping and Using Cart Horses. Stourbridge, 1845.
Evans' and Ruffey's Farmers' Journal and Agricultural Advertiser. 6 Vols. London, 1811–1819.
Evelyn, John. Silva, or a Discourse on Forest Trees. With Notes by Dr. A. Hunter. 2 Vols. York, 1786.
Ewart, J. Treatise on Agricultural Buildings. London, 1851.
Exposition Universelle de 1878 à Paris. Annexe au Règlement Général. Paris, 1877.
Extinction des Dettes de la France. Neufchatel, 1790.
Eyton, T. C. Herd-Book of Hereford Cattle. Vol. I., London, 1846. Vols. V.–IX., Hereford, 1862–76.

Falkner, F. The Muck Manual. London, 1843.
Fane, C. Tenant Right; its Necessity as a means of promoting Good Farming. London, 1849.
Farish, J. On Fiorin Grass. Dumfries, 1810.
Farm Account Book. Dublin, 1849.
Farm Book-Keeping, An Improved System of. London, 1851.
Farm Houses and Offices. A Series of Working Plans. Dublin.
Farm Life. London, 1861.
Farmer's Complete Guide. London, 1760.
Farmer's Friend, The. London, 1847.
Farmer's Guide, The. 2 Vols. London, 1770.
Farmer's Herald, The. Nos. 1–5. Chester, 1843.
Farmer's Herald Almanac for 1848. Liverpool.
Farmer's Library, The. 2 Vols. London, 1851.
Farmer's Magazine, The. 26 Vols. Edinburgh, 1806–1825.
———. Vols. 1 to 7, 9 and 10, 12 to 35, 38 to 43, 46 and 47, 51 to 58, 60 and 61. London, 1834–1864.
Farmer's Register, The. 10 vols. Petersburg, Va., 1833–1842.

Farming for Ladies. London, 1844.
Farming Implements. Their various uses. London, 1847.
Farrell, M. Berthollet's Chemical Affinity. Translated from the French. London, 1804.
Favre, J. C. Le Vétérinaire Campagnard. Geneva, 1837.
Ferguson, H. Distemper among Cattle. Dublin, 1842.
Fermoy Farming Society. Annual Report. Cork, 1812.
Finlayson, J. The British Farmer. London, 1829.
Fiore, F. M. Dell' Istituto Bonafons. Turin, 1871.
———. Ricerche sul Concetto e sullo Svolgimento delle Scienze economiche. Turin, 1869.
———. Sommi Principii del Diritto Civile. Turin, 1867.
Flax, Directions for Raising. Edinburgh, 1802.
Flax and Agricultural Improvement Association. First Annual Report. Ipswich, 1844.
Flax Society's Reports. Belfast, 1844–1850.
Flax Supply Association. Annual Report. Belfast, 1873.
Fleming, John. History of British Animals. Edinburgh, 1828.
Flint, C. L. Manual of Agriculture. Boston, U.S., 1862.
Food for the Million. London, 1847.
Food Supply, Remarks on Increasing the. A Letter to Lord John Russell. London, 1847.
Foote, A. On the Manufacture of Manures. Boston, U.S.A., 1843.
Forbes' New Husbandry. London, 1786.
Forbes, C. On the Present State of the Agricultural Interest. London, 1816.
Forbes, F. Waste Lands. London, 1778.
Fordyce, G. Elements of Agriculture and Vegetation. London, 1796.
Forsyth, A. On the Potato. London, 1846.
Forsyth, Robert. The Principles and Practice of Agriculture. 2 Vols. Edinburgh, 1804.
Forsyth, W. The Culture and Management of Fruit Trees. London, 1802.
Fortegnelse over Statens Eiendomme. Christiania, 1862.
Fortescue, Earl. Public Schools for Middle Classes. London, 1864.
Fortune, R. Voyage Agricole et Horticole en Chine. Traduit de l'Anglais par M. le Baron de Montlezun Lagarde. Paris, 1853.
Foster, J. W. Lake Superior. Washington, 1851.
Fothergill, M. An Epitome of Guano and other Manures. London, 1849.
———. Superphosphate of Lime as a Manure. London, 1846.
Fox, W. On various Agricultural Reports submitted to the Board of Agriculture. London, 1796.
France, Atlas Géographique et Statistique de la. Paris.
———, le Propagateur de l'Industrie de la Soie en. Rodez, 1838.
Frankenstein, C. von. Tabellarischer Grundriss der Agriculturchemie. Graz, 1837.
Fraser, Robert. A Review of the Domestic Fisheries of Great Britain and Ireland. Edinburgh, 1818.
Free Trade Principles; their Effects upon British Industry and Taxation. London, 1849.
French, Hon. Charles. Designs of Houses for Labourers and Farmers in Ireland.
French, J. Expenses of Farming. Chelmsford, 1815.
French and English Dictionary. Boyer's. London, 1796.
———. Spiers'. 2 Vols. Paris, 1872.
Frend, W. The Effects of Paper Money on the Price of Provisions. London, 1801.
Friction in Wheel Carriages, On a Patent Machine for Annihilating.

Fries Martin. Handbuch der Praktischen Landwirthschaft. 2 Vols. Leipzig, 1852.
Fruit Trees, The Best Method of Pruning. London, 1732.
Fuchs, Dr. A. Bericht die fünfzigjährige Jubelfeier der K. K. Landwirthschafts-Gesellschaft in Wien, 1858. Vienna, 1858.
Fullbrook, C. The Wet and Dry Seasons of England, from 1846–1860. London, 1861.
Fyfe, W. W. Catechism of Agricultural Science. London, 1862.

Gage's Survey of Liverpool and Environs.
Gandy, Joseph. Designs for Cottages and Rural Buildings. London, 1805.
———. Rural Architecture. London, 1805.
Gant, F. J. Evil Results of Over-feeding Cattle. London, 1858.
Gant, S. The Cantelonian Patent Hydro-Incubators, Prices, &c. London, 1848.
Gardener, The. No. 92. London, 1844.
Gardeners' Chronicle and Agricultural Gazette, The. 32 Vols. London, 1842–1873.
Gasparin, Le Comte de. Cours d'Agriculture. 4 Vols. Paris, 1846.
———. Guide des Propriétaires des Biens soumis au Métayage. Paris, 1855.
Gayot, Eug. Atlas Statistique de la production des Chevaux en France. Paris, 1850.
——— and L. Moll. La Connaissance générale du Bœuf. Paris, 1860.
Geographical Society, Proceedings of the. 21 Vols. London, 1855–1877.
Geological Map of England and Wales.
Geological Society, Quarterly Journals of. 33 Vols. London, 1845–1877.
Georgical Essays on the Food of Plants and a new Compost for Vegetation. London, 1769.
German and English Dictionary. Lucas'. 2 Vols. Bremen, 1856.
Gesnero, J. M. Scriptores Rei Rusticæ. 2 Vols. Lipsiæ, 1773.
Gibbs, Antony and Sons. Nature and Properties of Peruvian and Bolivian Guano. London, 1844.
Gilbert, J. H., and J. B. Lawes. Memoirs on the Chemistry of Animal and Vegetable Growth. London, 1863.
———. On the Formation of Fat in the Animal Body. Cambridge, 1877.
———. The Rothamsted Memoirs from 1847–1863. 2 Vols. London, 1863.
Ginnani, F. Trattato delle Malattie del Grano in Erba. Pesaro, 1759.
Gioracchini, Paolino. Tesoro de Pastori. Perugia, 1613.
Girdler, J. S. Observations on Forestalling. London, 1800.
Gisors, A. M. Théatre d'Agriculture. 4 Vols. Paris, 1802.
Glanders and Farcy. A Treatise on. Bridport, 1797.
Glasnevin Agricultural Establishment. Syllabus of Lectures. Dublin, 1850.
Gleanings from Books on Agriculture. London, 1801.
Göbel, Dr. C. Agriculturchemie. Erlangen, 1850.
Goddard, H. Plans of a Pair of Cottages for Agricultural Labourers The R. A. S. E. First-Prize Model Cottages. London, 1848.
Goetz, M. Procédés de Culture des Prairies Naturelles, &c. Paris, 1871.
Goodale, S. L. A Sketch of Gail Borden. Portland, Mass., 1872.
Goodlet, W. Remarks on the Duke of Argyle's Essay on the Commercial Principles applicable to Contracts for the Hire of Land. Edinburgh, 1877.
Googe, B. The whole Art and Trade of Husbandry. London, 1614.
Gourcy, Comte Conrad de. Journal du Second Voyage Agricole en Angleterre et en Belgique. Paris, 1849.
———. Notes extraites d'un Voyage Agricole. Paris, 1851.
———. Relation d'une Excursion Agronomique en Angleterre et en Ecosse. Lyon, 1841.
———. Voyage Agricole. Paris, 1855.

Gourcy, Comte Conrad de. Voyage Agricole en France. Paris, 1854.
———. Voyage Agricole en Prusse, Hollande, Belgique, &c. Paris, 1863.
Grain, On Frugality and Economy in the Consumption of. London, 1800.
Grant, C. History of Mauritius. London, 1801.
Grantham, R. B. Public Slaughter Houses. London, 1848.
Great Britain, General View of the Agriculture of. 12 Vols. London, 1790–1794.
———, On the Situation of. London, 1813.
Green, R. An Address on Under-draining Wet and Cold Land. London, 1832.
Greenwood, Col. G. The Tree Lifter. London, 1844.
Griffiths, M. On the Best Mode of Harvesting Corn. Stourbridge, 1845.
Grove, J. Six Letters on Scarcity. London, 1758.
Guenon, F. Milch Cows. Translated from the French by W. H. Riall. Dublin, 1851.
Guérin-Meneville, A.M. Iconographie du Regne Animal de Cuvier. Paris, 1845.
———. Mission relative à la Muscardine. Paris, 1846.
———. Nécessité d'introduire l'Étude de la Zoologie dans l'Enseignement Agricole. Paris, 1847.
———. Sur les Acariens, les Myriapodes, les Insectes et les Helminthes dans les Pommes de Terre Malades. Paris, 1845.
———. Sur les Lépidoptères du genre Bombyx. Paris, 1847.
Guineas an Unnecessary Encumbrance on Commerce. London, 1803.
Guthrie, Wm. A New System of Modern Geography. London, 1795.
Guy, W. A. The Health of Towns. London, 1846.

Hales, Stephen. Vegetable Staticks. 2 Vols. London, 1738.
Hanbury, Rev. W. The Complete Body of Planting and Gardening. 2 Vols. London, 1770.
Hannam, J. On the Application of Rape Dust. London, 1842.
———. The Economy of Waste Manures. London, 1844.
Harcus, Wm. South Australia; its History, Resources, and Productions. London, 1876.
Harding, J. Catalogue of Books on Agriculture. London.
Hardy, J. A. Traité de la Taille des Arbres Fruitiers. Paris, 1853.
Hardy, Lieut.-Col. On Drill Husbandry. Dublin, 1802.
Harrison, E. On the Rot in Sheep Bury St. Edmunds, 1803.
Harte, Walter. Essays on Husbandry. 2 Vols. London, 1770.
Hartig, Dr. T. Luft-Boden und Pflanzen-Kunde. Stuttgart, 1851.
Hartley, W. Sorgho, or Sugar Grass. Lille, 1858.
Hartlib, Samuel. Husbandry in Brabant and Flanders. London, 1652.
Harvey, A. On a Remarkable Effect of Cross Breeding. London, 1851.
Hasttfer, F. W. La Manière d'Elever les Bêtes à Laine. Paris, 1756.
Hayden, F. V. Geological Surveys of Montano, Idaho, Wyoming and Utah. Washington, 1873.
Haywood. Letters to Farmers. London, 1852.
Headrick, James. Island of Arran. Edinburgh, 1807.
Helbroeck, J. L. van. L'Agriculture en Flandre. Paris, 1830.
Hellouin, M. P. Expériences sur le Chaulage des Blés. Caen, 1848.
Hemp and Flax, On the European Method of Cultivating and Managing. Edinburgh, 1797.
Henderson, Andrew. The Practical Grazier. London, 1856.
Henderson, R. On the Breeding of Swine and Curing of Bacon. Leith, 1811.
———. On Hemp and its Culture. Leith, 1811.
———. On Preventing and Curing Disease in Horses. Leith, 1811.
Henry, William. Epitome of Chemistry. London, 1803.
Henslow, Rev. J. S. Letters to the Farmers of Suffolk. London, 1843.

Herbin, P. E. Statistique Générale et Particulière de la France et ses Colonies. 7 Vols. Paris, 1803.
Herefordshire Agricultural Society, Plan and Rules of the. Hereford, 1798.
Heriot, George. Travels through Canada. London, 1807.
Hetting, M. G. Beretning om hoad der til Ferskvandsfiskeriernes-Fremme, 1862–1872. Christiania. 4 Vols.
Hibbard, John. On Canal Navigation. London, 1804.
———. On the Utility of Canal Navigation. London, 1796.
Hibbert, W. New Theory and Practice of Medicine. Hibbert's Patent Antiseptic Solutions. Manchester, 1870.
———. New Theory and Practice of Medicine as applied to Animals. Manchester, 1870.
Highland Society of Scotland. Prize Essays. 6 Vols. Edinburgh, 1799–1824.
———. Ditto. New Series. 19 Vols. Edinburgh, 1829–1865.
———, Transactions of the. New Series. 9 Vols. Edinburgh, 1866–1877.
———. Report on the Potato Disease. Edinburgh, 1845.
Hill, A. On the Rise and Progress of the Beech-Oil Invention. London, 1715.
Hill, John. The Construction of Timber. London, 1770.
Hillyard, C. Practical Farming. Northampton, 1837.
———. Practical Farming and Grazing. London, 1844.
Hincks, T. C. Hints for Increasing the Practical Usefulness of Agricultural Shows. London, 1845.
Hine, T. An account of the Giant Sainfoin. London, 1849.
Hine, T. C. Drawings and Specifications of a Labourer's Cottage. London, 1848.
———. Plans of a pair of Cottages for Agricultural Labourers. The R. A. S. E. Second-Prize Medal Cottages. London, 1848.
Hiort, H. On Farinaceous Seeds and Pulse. London, 1832.
Histoire de l'Agriculture ancienne. Paris, 1765.
Hocke, J. W. Böhmens Hopfenbau. Vienna, 1846.
Hodges, John F. Practical Chemistry. London, 1857.
———. What Science can do for the Irish Farmer. Dublin, 1844.
Hodges, T. L. On Pearson's Draining Plough. London, 1833.
Hofmann, F. W. Das Obstbuch. Pest, 1855.
———. Das Tret-Rad. Vienna, 1844.
———. Der Hopfenbau. Gortlitz, 1843.
———. Die Bienenzucht. Vienna, 1854.
———. Die Cultur der Handelsgewächse. Prague, 1845.
———. Die Cultur des Hopfens. Vienna, 1861.
———. Die Gesammtlandwirthschaft. Vienna, 1852.
———. Hospodárstoí v. Obrarích pro Maládez. Vidni, 1858.
———. Landwirthschaftlicher Anschauungsunterricht. Vienna, 1853.
———. Mezögazdasági Szemléleti oktatás. Bécsben, 1857.
———. Sadownictwo. Lwów, 1857.
———. System des Reinertrag der Güter. Vienna, 1857.
———. System des Futterbaues. Vienna, 1852.
———. Weincultur. Vienna, 1861.
———. Wirthschaftsrath in Wien. Pest, 1855.
Hofmann, J. P. Das Chemische Laboratorium zu Giessen. Heidelberg, 1842.
Holdsworth, A. H. On the Present Situation of the Country. London, 1816.
Hollinshead, J. Hints to Country Gentlemen and Farmers on the importance of using Salt as a General Manure. Blackburn, 1800.
Home, D. Milne. Agricultural Schools and Experimental Farms. Edinburgh, 1871.

Home, F. The Principles of Agriculture and Vegetation. London, 1776.
Home, Henry. The Gentleman Farmer. Edinburgh, 1798.
Hook, J. A Sermon on the Present Scarcity. London, 1800.
Hooker, J. D., Testimonials in favour of, as a Candidate for the vacant Chair of Botany. Edinburgh, 1845.
Hops. Instructions for Planting and Managing. London, 1732.
Horse, The. London, 1831.
Horton, R. Tables for Valuing Woodland, &c. London, 1832.
———. Underwood and other Tables. London, 1832.
House of Recovery in Dublin, The First Report of the Object and Effects of the. London, 1806.
Howard, L. Papers on Meteorology. 2 Vols. London, 1850.
Huber, M. P. Natural History of Ants, translated from the French by J. R. Johnston. London. 1820.
Hudson, J. Annual Farming Account Book. London, 1851.
Hudson, W. Flora Anglica. London, 1798.
Huguin and Co.'s Concentrated Manure. Paris, 1851.
Humboldt, A. de. New Spain. 4 Vols. London, 1811.
Hundeshagen, Dr. J. C. Forstliche Produktionslehre. Tübingen, 1842.
Hunt, Charles. The Merino Breeds of Sheep. London, 1809.
Hunter, A. Georgical Essays. York, 1777.
———. Georgical Essays. 6 Vols. York, 1804.
Hutchinson, Henry. Practical Drainage of Land. London, 1844.
Hutchison, R. Premium Report on the Progress of the more Recently Introduced Coniferæ.
Hutchinson, S. Instructions on the Drainage of Land. Grantham, 1847.
———. Practical Experiments on the Air-Drainage of Land. Grantham, 1848.
Hutchinson, William. History of the County of Cumberland. 2 Vols. Carlisle, 1794.
Hutt, William. British Agriculture. London, 1837.
Huxtable, Rev. A. On the Science and Application of Manures. London, 1847.
Hyett, W. The Chemical Effects of Particular Manures. Gloucestershire, 1841.

Illingworth, W. Treatise on Travelling. London, 1800.
Indian Corn, On the Uses and Advantages of. London, 1847.
Insectes Nuisibles, Moyens propres à détruire les. Paris, 1847.
Institut Agricole de l'État à Gembloux. Bulletin. 1860–1867. Brussels, 1868.
Institut National Agronomique. Programme. 1877.
Institution of Civil Engineers. Proceedings. 32 Vols. London, 1859–1877.
———. Catalogue of Library. London, 1866.
Institution of Mechanical Engineers. Proceedings of. 16 Vols. London, 1861–1876.
Institution of Surveyors. Transactions. 10 Vols. London, 1868–1878.
Iowa, Geological Survey of the State of. 1858.
Ireland, Essays on the Population of; and on the Character of the Irish. London, 1803.
———, Royal Agricultural Improvement Society. Reports, 1841–1843. Dublin.
———, Statistical Surveys of. 25 Vols. Dublin.
Irish Amelioration Society. London, 1848.
Irish Farmers' and Gardeners' Magazine, No. 88. Dublin, 1841.
Irish Fiorin Grass. Belfast, 1808.

Irvine, Alexander. An Inquiry into the Emigration from the Highlands. Edinburgh, 1802.
Isoré, M. Grande Culture des Terres. 2 Vols. Paris, 1802.
Italian and English Dictionary. Baretti's. London, 1798.
Ith, Y. Ueber Menschenveredlung. Bern, 1797.
Itier, Jules. Voyage en Chine. 3 Vols. Paris, 1853.

Jacob, W. An Inquiry into the Causes of Agricultural Distress. London, 1816.
———. The Agriculture, Manufactures, &c., of Germany. London, 1820.
Jay, John. A Statistical View of American Agriculture. New York, 1859.
Jemmett, Alexander. New Farm Account Book. London, 1868.
Jenkins, H. M. Report on the Agriculture of Denmark. London, 1876.
———. Report on the Agriculture of Sweden and Norway. London, 1875.
———. Report on the Cultivation of Potatoes, with special reference to the Potato Disease. London, 1876.
———. Report on the Trade in Animals. London, 1873.
———. The International Dairy Exhibition at Hamburg, 1877. London, 1877.
———. Report on some Features of Scottish Agriculture. London, 1871.
Jerdan, G. A view of the Transactions of the Border Agricultural Society. Kelso, 1844.
Jesse, George R. Evidence given before the Royal Commission on Vivisection. London, 1875.
Jewitt, L. The Hand-Book of Exeter, and Visitors' Guide to the Royal Agricultural Show. Exeter, 1850.
———. Ditto, of Norwich. Norwich, 1849.
Johnson, Cuthbert W. Agricultural Chemistry for Young Farmers. London, 1840.
———. Crushed Bones as a Manure. London, 1836.
———. Farmers' Encyclopedia. London, 1842.
———. Guano as a Fertilizer. London, 1843.
———. Gypsum as a Fertilizer. London, 1840.
———. Saltpetre and Nitrate of Soda as Fertilizers. London, 1841.
———. Thaërs' Principles of Agriculture. 2 Vols. London, 1844.
———. The Advantages of Railways to Agriculture. London, 1837.
———. The Agricultural Value of Sewer and other Drainage Waters. London, 1849.
Johnson, Dr. Dictionary of the English Language. 2 Vols. London, 1797.
Johnson, G. W. On the General Importance of Railways. London, 1837.
Johnson, J. On Agricultural Improvements. Hull, 1813.
Johnson, J. R. Natural History of Ants, translated from the French of M. P. Huber. London, 1820.
Johnson, S. W. How Crops Feed. New York, 1874.
———. Agricultural Chemistry and Geology. Edinburgh, 1844.
Johnston, J. F. W. Elements of Agricultural Chemistry. Edinburgh, 1844.
———. Elements of Agricultural Chemistry and Geology. London, 1852.
———. Scientific Agriculture, Edinburgh, 1849.
———. Suggestions for Experiments in Practical Agriculture. London, 1841.
Johnstone, J. Elkington's Mode of Draining Land. London, 1801.
———. The most Approved Method of Draining Land. Edinburgh, 1797.
Johnstone, M. Speech of, on Lord Stanhope's Bill respecting Gold Coin. London, 1811.
Journal d'Agriculture Pratique. J. A. Barral. Paris, 1857; also 1871–1877
——— A. Bixio. Paris, 1838.
Journal d'Agriculture Progressive. Paris, 1867.

Journal d'Agriculture, d'Economie rurale et des Manufactures du Royaume des Pays Bas. 3 Vols. Brussels, 1817.
Journal de l'Agriculture. 1871–1877.
Journal für Landwirthschaft. 1862, 1870–1878. 6 Vols. Gottingen.

Karbe, A. Über Schafwaide-Ablösungen. Stuttgart, 1840.
Kenefecke, J. de C. On Flax Growing. London, 1850.
Kent, N. Hints to Gentlemen of Landed Property. London, 1793.
Ker, A. Lavoisier's Chemistry. Translated from the French. 2 Vols. Edinburgh, 1802.
———. Report on the State of Sheep Farming. Edinburgh, 1791.
Kerr, R. Agriculture of Berwick. London, 1809.
Kerrison, Lady Caroline. Labourers' Cottages. London, 1864.
Kette, W. Die Lupine als Feldfrucht. Berlin, 1877.
Keyplate to Painting of the R. A. S. E. Meeting, 1846.
King T. On Propagating Potatoes. Dublin, 1794.
Kinnaird's (Lord) Model Farm, and the Steam Plough in the Carse of Gowrie.
Kirchhof, F. Der Deutsche Landwirth. Leipzig, 1845.
Kirwan, R. The Manures most advantageously Applicable to the various sorts of Soils. London, 1796.
Kjekstad, B. Anhang til Buskerudo Amtsformandokales Forhandlinger for 1874. Drammen, 1875.
Klenze, Dr. von. Untersuchungen über die Kapillare Wasserleitung im Boden. Berlin, 1876.
Klubek, Dr. F. X. Steiermärkische Landwirthschaft. Graz, 1846.
Knapp, J. L. Gramina Britannica, or British Grasses. London, 1804.
Knaus, C. Ueber Schafwaide-Ablösungen. Stuttgart, 1840.
Knight, F. Washington's Agricultural Correspondence. Philadelphia, 1847.
Knight, T. A. Culture of the Apple and Pear. Ludlow, 1801.
Koerner, T. Die Landwirthschaft in Grossbritannien. Berlin, 1877.
Kuhlmann, F. La théorie de la Nitrification et la Fertilisation des Terres. Lille, 1847.

Labourer, Hints for the. London, 1839.
Lagarde Montlezun, Baron de. Voyage Agricole et Horticole en Chine. Traduit de l'Anglais de Robert Fortune. Paris, 1853.
Lance, E. J. Land Drainage and Irrigation. London, 1841.
———. The Hop Farmer. London, 1838.
Landtbruks Akademiens Tidskrift. 12 Vols. Stockholm, 1862–1873.
Landwirthschaftlicher Jahrbücher. 5 Vols. Berlin, 1874–1877.
Lankester, Edwin. Microscopical Examinations of the Thames and other Waters. London, 1852.
Lapa, J. I. F. Artes Chimicas, Agricolos e Florestaes, no Technologia Rural. 3 Vols. Lisbon, 1865.
———. Relatorio do Estudo Industrial e Chimico dos Trigos Portuguezes. Lisbon, 1862.
Lasteyrie, C. P. Constructions rurales. Paris, 1802.
———. Histoire de l'Introduction des Moutons à laine fine d'Espagne. Paris, 1802.
Latin and English Dictionary. London, 1796.
Latreille, P. A. Histoire Naturelle des Fourmis. Paris, 1802.
Lauderdale, the Earl of. On the Nature and Origin of Public Wealth. Edinburgh, 1804.
———. On the State of the Circulation, and on the means of Redressing the Pecuniary Grievances in Ireland. Edinburgh, 1805.

Laurence, J. A New System of Agriculture. London, 1726.
Laveleye, Emile de. Essai sur l'Économie rurale de Belgique. Paris, 1863.
———. La Néerlande. Paris, 1865.
Laverne, L. de. Économie rurale de l'Angleterre, de l'Écosse et de l'Irlande. Paris, 1854; New Edition, 1863.
———. Economie rurale de la France depuis 1789. Paris, 1866.
———. L'Agriculture et la Population. Paris, 1865.
Lavoisier's Chemistry. Translated from the French by A. Ker. 2 Vols. Edinburgh, 1802.
Lawes, J. B. Unexhausted Tillages and Manures. Dublin, 1870.
———, and Dr. J. H. Gilbert. Memoirs on the Chemistry of Animal and Vegetable Growth. London, 1863.
———. On the Formation of Fat in the Animal Body. Cambridge, 1877.
———. The Rothamsted Memoirs, from 1847–1863. 2 Vols. London, 1863.
Lawrence, Charles. Handybook for Young Farmers. London, 1859.
Lawrence, John. The Modern Land Steward. London, 1801.
———. The New Farmer's Calendar. London, 1800.
Lawrence, R. Structure and Diseases of the Horse. Birmingham.
Lawson and Son. Cultivated Grasses and other Herbage and Forage Plants. Edinburgh, 1843 and 1845.
———. The Agriculturist's Manual. Edinburgh, 1836.
Lawson, S. Mixed and Compressed Cattle Fodder. London, 1801.
———. On the use of Mixed and Compressed Cattle Fodder. London, 1797.
Leases, Treaties on. London, 1736.
Le Couteur, F. R. Sur la Culture des Pommes et sur le Cidre. Jersey, 1806.
Le Couteur, J. Varieties of Wheat. Jersey, 1837.
Lecouteux, E. Culture et Ensilage du Maïs-fourrage. Paris, 1875.
Lee, W. On the Application of Sewerage Water to Irrigation and Agriculture. Report to the Board of Health. London, 1851.
L'Emploi des Os appliqués à l'Engrais des Terres. Brussels, 1834.
Lefebvre, A. Dissertation sur la Méthode curative de la Morve. Malines, 1833.
Lefebvre S. Marie. De la Race Bovine courte-corne améliorée, dite Race de Durham. Paris, 1849.
Legh, P. On Anemology and Ombrology, with a Weather Almanac for 1849. London, 1849.
Leicestershire Agricultural Society. Programme of Annual Meeting, &c. Leicester, 1849.
Leipziger Ökonomischen Societät. Anzeigen. Dresden, 1801, 1802.
———. Schriften. Dresden, 1771.
Lewis, J. Uniting and Monopolising Farms plainly proved disadvantageous to the Landowners, and highly prejudicial to the Public. Ipswich, 1801.
Liebig, Prof. An Address to the Agriculturists of Great Britain on Artificial Manures.
———. Chemistry of Agriculture and Physiology. London, 1842.
Lightfoot, John. Flora Scotica. 2 Vols. London, 1777.
Lincke, C. A. Die Sachsische und Altenburgische Landwirthschaft. Leipzig, 1851.
Lincoln, General View of the Agriculture of. London, 1799.
Lindgren, S. J. Vigtigare Svensken Fodervecter. Skara, 1845.
Linnean Society, Transactions of the. 11 Vols. London, 1791–1815.
Liquid Manure the Wealth of Towns. London, 1845.

Lisle, E. Observations on Husbandry. 2 Vols. London, 1757.
Little, J. Mountain Sheep. Edinburgh, 1815.
Livingston, R. R. Essays on Sheep. London, 1811.
Loch, James. Account of the Marquis of Stafford's Estate Improvements. London, 1820.
Logan, G., M.D. Fourteen Agricultural Experiments to ascertain the Best Rotation of Crops. Philadelphia, 1798.
———. On the Rotation of Crops. Philadelphia, 1797.
Loudon, J. C. Arboretum et Fruticetum Britannicum. 8 Vols. London, 1844.
———. Encyclopædia of Agriculture. London, 1839.
———. Encyclopædia of Trees and Shrubs. London, 1842.
Love, P. The Advantages of One-horse Carts over Waggons. Grantham, 1848.
Lovelace, The Earl of. On Harbours of Refuge. London, 1849.
Low, D. Landed Property. London, 1844.
———. Practical Agriculture. London, 1843.
———. The Breeds of the Domestic Animals of the British Islands. 2 Vols. London, 1842.
———. The Domesticated Animals of the British Islands. London, 1845.
———. The Effects of Free Trade on Agriculture. London, 1850.
Lucas, J. An Impartial Inquiry into the Present State of Parochial Registers, &c. Leeds, 1791.
Lucas, N. J. Dictionary, English and German—German and English. 4 Vols. Bremen, 1856.
Luccock, John. On Wool. London, 1809.
Ludlow Agricultural Society. Rules and Regulations. Ludlow, 1848.
Lugar, R. Architecture of Cottages, Rural Dwellings, &c. London, 1805.
Lullen, Ch. Associations rurales pour la fabrication du Lait. Paris, 1811.
———. Bêtes à laine. Geneva, 1807.
Lurieu, G. de. Etudes sur les Colonies Agricoles. Paris, 1851.
Lyell, Charles. Elements of Geology. 2 Vols. London, 1841.
———. Principles of Geology. 3 Vols. London, 1840.

Macbride, David. Art of Tanning. London, 1780.
Mackenzie, Sir F. A. Hints for Highland Tenants. Inverness, 1838.
Mackenzie, Sir G. S. Diseases and Management of Sheep. Edinburgh, 1809.
Magazign voor Landbouw. Utrecht, 1865.
Magna Britannia et Hibernia. 8 Vols. London, 1720.
Magne, J. H. Etude de nos Races d'Animaux domestiques. 2 Vols. Paris, 1857.
———. Recherches sur les Fromageries de Société. Paris, 1841.
Main, Gan J. Garddwriaeth Teuluaidd. Ruthyn, 1847.
Main, J. Forest Planters' Assistant. London, 1839.
Maine, Agriculture and Geology of. 17 Vols. Augusta, U.S.A., 1859–1877.
Maitland, John. Wool, British and Foreign. London, 1818.
Maize: its Culture and Uses. London, 1849.
Malcolm, J. Agriculture of Surrey. 3 Vols. London, 1805.
Malham, J. The Mischief of Forestalling, Engrossing, and Regrating, considered. Salisbury, 1800.
Malt Distillery. London, 1739.
Malton, James. British Cottage Architecture. London, 1804.
Malthus, Professor. An Investigation of the Cause of the Present High Price of Provisions. London, 1800.
———. An Essay on the Principle of Population. London, 1803.

Manchester, Literary Society of. Report of the Committee on the Potato Disease. Manchester, 1845.
——— Literary and Philosophical Society, Proceedings of the. 8 Vols. Manchester, 1865–1876.
———, Memoirs of the. 5 Vols. London, 1862–1876.
Manchester and Liverpool Agricultural Society, Journal of the. Liverpool, 1868.
Mann, D. D. New South Wales. London, 1811.
Mann, L'Abbé. Sur les grands Gélées et leurs Effets. Ghent, 1792.
Manwaring, H. M. On the Cultivation and Growth of Hops. London, 1855.
Maples, J. J. The Working Farmer. New York, 1850–1853.
Märkischen Oekonomischen Gesellschaft zu Potsdam, Annalen der. Potsdam, 1792.
Mark Lane Express. 40 Vols. London, 1838–1877.
Marshall on Planting. 2 Vols. London, 1796.
Marshall, J. On the Appropriation and Enclosure of Commonable and Intermixed Lands. London, 1801.
Marshall, Mr. Proposals for a Rural Institute or College of Agriculture. London, 1799.
Marshall, W. Minutes of Agriculture. London, 1783.
———. Review of Agricultural Reports. York, 1818.
———. Rural Economy of Gloucestershire. 2 Vols. Gloucester, 1789.
———. Rural Economy of Midland Counties. 2 Vols. London, 1790.
———. Rural Economy of Norfolk. 2 Vols. London, 1795.
———. Rural Economy of Southern Counties. 2 Vols. London, 1798.
———-. Rural Economy of Southern Counties and Vale of London. 2 Vols. London, 1799.
———. Rural Economy of West of England. 2 Vols. London, 1796.
———. Rural Economy of Yorkshire. 2 Vols. London, 1788.
———. The Landed Property of England. London, 1804.
Marsham, T. On the Insects that Infested the Corn in 1795. London, 1796.
Martin, John. On Drainage. London, 1847.
———. Plan for Diverting the Sewage of the Metropolis from the Thames and applying it to Agriculture. London, 1850.
Martin, William. Universal Weights and Measures. London, 1794.
Martiny, B. Die Milch: ihr Wesen und ihre Bewerthung. 2 Vols. Danzig, 1872.
Massachusetts, Agricultural Reports of. 23 Vols. Boston, U.S.A., 1807–1876.
———, Geological Survey of. 2 Vols. Amherst, U.S.A., 1841.
Matthews, J. On the Scarcity of Cattle, &c. London, 1797.
Maughan, J. On Farming Leases. Stourbridge, 1845.
Maunsell, Rev. Dr. On the Culture of Potatoes. Dublin, 1794.
———. On Raising Potatoes from Shoots. Dublin, 1802.
Mavor, W. Tusser's Husbandry. London, 1812.
Maxwell, R. The Practical Husbandman. Edinburgh, 1757.
———. Transactions of the Society of Improvers of Agriculture in Scotland. Edinburgh, 1743.
Mayhew, E. The Horse's Mouth, showing the Age by the Teeth. London, 1849.
McArthur, John. Financial and Political Facts. London, 1801.
McCombie, W. Cattle and Cattle Breeders. Edinburgh, 1869.
McDerment, J. The Farmer's Assistant. Ayr, 1839.
McWilliam, Robert. Essay on Dry Rot. London, 1818.
Mechi, J. J. Agricultural Improvement. London, 1845.
———. British Agriculture. London, 1850.

Mechi, J. J. Letters on Agricultural Improvement. London, 1845.
Meheust, P. Economie rurale de la Bretagne. Paris, 1874.
Mélanges Agronomiques. Leipsic, 1789.
Mémoire sur les Défrichements. Paris, 1761.
Mémoires d'Agriculture, d'Économie rurale et domestique. 13 Vols. Paris, 1848–1867.
Mémoires de Berne. 21 Vols. Zürich, 1760–1769.
Meteorological Observations. Washington, 1864.
Météorologie des Cultivateurs. Paris, 1798.
Méthode Nouvelle de Cultiver le Champignon. Brussels.
Metropolitan Sanitary Commission. Reports. 2 Vols. London, 1847–1848.
Michigan Agricultural Society, Transactions of the. 8 Vols. Lansing, U.S.A., 1849–1856.
Michigan State Board of Agriculture. Report for 1872.
Michelson, C. Die landwirthschaftlichen Verhältnisse im Vereinsbezirk Hohenhameln. Hildesheim, 1877.
Miles, William. On the Horse's Foot. London, 1847.
Military and Naval Strength of France and Russia. London, 1803.
Miller, P. Gardeners' and Botanists' Dictionary. 4 Vols. London, 1807.
Mills, John. A New System of Practical Husbandry. 5 Vols. London, 1767.
———. The Natural and Chemical Elements of Agriculture. London, 1770.
Milne, C. Botanical Dictionary. London, 1778.
Milton, Rev. W. The Danger of Travelling in Stage Coaches. Reading, 1810.
Ministero di Agricoltura d'Italia, Allevamento Ovino e Suino. Rome, 1874.
———. Circolare ai Presidenti dei Comizie delle Associazioni Agrarie. Rome, 1874.
Ministero di Agricoltura Industria e Commercio. Annali. 6 Vols. Turin, 1870–1872.
Mirehouse, J. Law of Tithes. London, 1818.
Mitchell. Manual of Agricultural Analysis. London, 1845.
Mittheilungen der Kaiserlich freiern œkonomischen Gesellschaft zu St. Petersburg. Leipsic, 1849–1859.
Mohn, H. Norges Vind. ag. Stormstatik. Christiania, 1869.
Moll, L., and E. Gayot. La connaissance générale du Bœuf. Paris, 1860.
Monceau, Duhamel du. Conservation des Grains. Paris, 1754.
———. Éléments d'Agriculture. 2 Vols. Paris, 1762.
———. Manuel Forestier. Paris, 1770.
———. Practical Treatise of Husbandry, London, 1762.
Monk, John. Agricultural Dictionary. 3 Vols. London, 1794.
Montgomeryshire Canal Company, Case of the. Shrewsbury, 1796.
Moore, Sir J. England's Interest. London, 1721.
Moore, Thomas. The Ferns of Great Britain and Ireland. London, 1855.
Morcière, Général de la. L'espèce Chevaline en France. Paris, 1850.
Morgan, J. M. Religion and Crime. London, 1840.
Morley, John. Directions for Preparing and Using an excellent Compost. Norwich.
Morley, W. H. Descriptive Catalogue of Historical MSS. (Arabic and Persian) in the Library of the Royal Asiatic Society of Great Britain. London, 1854.
Morris, E. A Short Inquiry into the Nature of Monopoly and Forestalling. London, 1800.
Mortimer, J. The Whole Art of Husbandry. 2 Vols. London, 1721.
Morton, John. Nature and Property of Soils. London, 1840.
Morton, J. C. Cyclopædia of Agriculture. 2 Vols. Edinburgh, 1855.

Morton, J. C. Report on the Whitfield Farm. London, 1840.
———. The Prince Consort's Farm. London, 1863.
———. Baylden's Art of Valuing Rents and Tillages. Ninth Edition, by. London, 1876.
Morton, W. J. T. Calculous Concretions in the Horse, Ox, &c. London, 1804.
———. Manual of Pharmacy. London, 1843.
Mounier, M. L., and M. Rubichon. L'Agriculture en France. 2 Vols. Paris, 1846.
Mountmorres, Viscount. Impartial Reflections on the Present Crisis; in Four Essays. London, 1796.
Mueller, Baron F. von. Select Plants readily eligible for Industrial Culture or Naturalisation in Victoria. Melbourne, 1876.
Mülder, D. J. Chemistry of Vegetable and Animal Physiology. 2 Vols. Edinburgh, 1845.
Murphy, E. A Treatise on Agricultural Grasses. Dublin, 1844.
Myers, W. J. and Co. Nature and Properties of Peruvian and Bolivian Guano. London, 1844.

Nash, J. A. The Progressive Farmer. New York, 1853.
National Disinfected and Dry Manure Company, Report of. London, 1850.
National Prosperity Ensured by Improving Agriculture. London, 1737.
National Schoolmasters, Hints for. London, 1839.
National Wealth, Essay on. Norwich, 1794.
Naval Timber, The Means of Providing. London, 1807.
Nederlandsch Rundvee-Stambock. 2 Vols. Schiedam, 1875–1876.
Nesbit, J. C. On Agricultural Chemistry. London, 1849.
Neues Wochenblatt des Landwirthschaftlichen Vereins in Bayern. 25 Vols. Munich, 1820–1835.
New Farmers' Journal. 5 Vols. London, 1842–1846.
New Forest, Map of the. Southampton, 1849.
New Jersey, Geological Survey of the State of. 1869.
New York, Natural History of the State of. Albany, 1867.
New-York State Agricultural Society. Premiums and Regulations for the Annual Show at Syracuse. Albany, 1849.
———, Transactions of the. 36 Vols. New York, 1841–1871.
Newenham, Thomas. View of Ireland. London, 1809.
Newman, Charles. Land Draining. London, 1845.
———. Landlord and Tenant. London, 1860.
Newnham, H. Agriculture: its Practice with Profit. London, 1844.
Nicholas, J. L. New Zealand. 2 Vols. London, 1817.
Nicholls, George. Condition of the Agricultural Labourer. London, 1847.
———. On the Poor Laws of Ireland. London, 1838.
———. The Farmer. London, 1844.
———. The Flax Grower. London, 1848.
Nichols, T. Methods Proposed for Decreasing the Consumption of Timber in the Navy. Southampton, 1793.
———. On Planting Oak Trees. London, 1795.
Nivière, C. Annales Agricoles de la Saulsaie. Paris, 1841.
Nolan, J. J. Ornamental, Aquatic, and Domestic Fowls. Dublin, 1850.
Nordisk Landvorsens Magasin. Copenhagen, 1802.
Nördlinger. Die kleinen Feinde der Landwirthschaft. Stuttgart, 1855.
Norfolk and Suffolk Herd Book. Norwich, 1875.
Norges Officielle Statistik. Christiania, 1866–1875.
Northern Wisconsin, Agriculture of. Oshkosh, U.S.A., 1874.

Notizie e Studi sull' Agricoltura. Rome, 1877.
Nowell, J. On Farms of Industry. Huddersfield, 1843.

Oddy, J. J. On the Improvement of the Interests of Britain by Inland Navigation. London, 1810.
Œconomic Institution Address. London, 1816.
Oesterreicher-Rundvieh-Racen. Wien, 1859.
Ohio Agricultural Report. 22 Vols. Columbus, U.S.A., 1851–1875.
Ohio, Geological Survey of. Columbus, 1871.
Ontario, Annual Report on the Agriculture, &c., of the Province of. 4 Vols. Toronto, 1870-1875.
Owen, R. Address to the Lanark Institution. London, 1817.
Owen, T. Geoponika. 2 Vols. London, 1806.
———. M. Porcius Cato on Agriculture. London, 1803.
———. The Fourteen Books of Palladius Æmilianus. London, 1807.

Pabst, H. W., and Dr. Schweitzer. Die Versammlung Deutsche Landwirthe zu Dresden, 1837. Leipzig, 1838.
Pallas, Dr. Russian Sheep. Edinburgh, 1794.
Palleul, C. Sur l'Utilité qu'on peut tirer des Marais desséchés. Paris, 1797.
Parey, P. Verlags Katalog von Wiegand, Hempel, und Parey. Berlin, 1878.
Paris Universal Exhibition, 1867. Catalogue of British Section. London, 1867.
Parkes, J. Fallacies on Land Drainage exposed. London, 1851.
———. On the Philosophy and Art of Land Drainage. London, 1848.
———. On Steam Boilers and Steam Engines. London, 1843.
Parkes, S. Chemical Catechism. London, 1806.
———. On the Laws relating to Salt. London, 1817.
Parkin, John. Prevention and Treatment of Potato Disease. London, 1847.
Parkinson, John. The Yearly Farmer's Account Book. London, 1846.
Parkinson, Richard. Breeding and Management of Live Stock. 2 Vols. London, 1810.
———. The English Practice of Agriculture. London, 1806.
———. The Experienced Farmer. 2 Vols. London, 1798.
Parlatore Filippo. Le Specie dei Cotoni. Firenze, 1866.
Parliamentary Papers, Reports and Returns :—
Agricultural Returns of Great Britain for the years 1867 to 1877. London.
Barbadoes. Report by Governor Rawson upon the Rainfall of; and upon its Influence upon the Sugar Crops from 1847–1871. Barbadoes, 1874.
Cattle. On Feeding with Malt. London, 1846.
Cattle Plague in Great Britain from 1865–1867. London, 1868.
Cattle Plague in India, Origin and Nature of the. London, 1871.
Census of England and Wales for the year 1871. General Report. London, 1873.
Corn Laws. 2 Vols. London, 1814.
Cotton Exports from the Central Provinces and the Berars. Report of the Cotton Commissioner, H. Rivett-Carnac. Calcutta 1870.
Cotton in the Nicobar Islands. Report of H. Rivett-Carnac. Calcutta, 1870.
Crown Woods, Forests, and Land Revenues. 4 Vols. London, 1787–1812.
Employment of Children, Young Persons, and Women in Agriculture. 8 Vols. London, 1843–1870.

Parliamentary Papers, Reports, and Returns:—
Enclosures. London, 1808.
Entailed Estates. London, 1845.
Foreign Countries, Statistical Tables relating to. London, 1870.
General Index to the Accounts and Papers, Reports of Commissioners, Estimates, &c., from 1801–1852. London, 1853.
———, from 1852–1861. London, 1862.
General Index to the Reports of Select Committees, from 1801–1852. London, 1853.
Government Experimental Farm at Madras, Agricultural Experiments at the. Madras, 1871.
Great Britain, Population of, and the Increase in the Diminution thereof. 2 Vols. London, 1802.
Ireland, Bogs in. 3 Vols. London, 1812–1819.
———, Public Works in. London, 1824.
Labouring Population of Great Britain, the Sanitary Condition of. London, 1842.
Live Stock, Report on, to the Legislative Assembly of New South Wales. Sydney, 1874.
Poor, The Expense and Maintenance of the, in England. London, 1805.
———, The Relief of the. London, 1849.
Potatoes, The Culture and use of. London, 1795.
Salt Duties. London, 1818.
Tasmania, Statistics of, 1870–1875. 6 Vols.
Tenure of Land. London, 1870.
Trade and Navigation of the United Kingdom with Foreign Countries and British Possessions in the Year 1869. London, 1870.
——— for the year 1873. London, 1874.
Veterinary Department, 1871–1877. 7 Vols. London.
Victoria, Report of the Secretary of Agriculture for. Melbourne, 1873.
Wool. London, 1828.

Parmentier, M. Expériences de Lait. Strasbourg, 1803.
———. Ouvrage sur les Pommes de Terre, le Froment, et le Riz. Paris, 1774.
———. Traité sur la Culture des Grains. 2 Vols. Paris, 1802.
Parry, C. H. Facts and Observations respecting the Production of Clothing Wool in the British Isles. Bath, 1800.
Parry, R. Particulars of the Breeding Stock of the late Mr. Fowler, of Little Rollright. 1843.
Passy, M. H. Systêmes de Culture. Paris, 1846.
———. Ditto. Paris, 1853.
Patent Office Reports. 33 Vols. Washington, 1860–1871.
Patriotic Competition against Self-Interested Combination recommended. London, 1800.
Patterson, R. On the Study of Natural History. London, 1847.
Patterson, W. Climate of Ireland. Dublin, 1804.
Paul, G. O. Observations on a Bill before Parliament for Facilitating the Division and Enclosure of Waste Lands and Commons, &c. London, 1796.
Payen, A. Précis d'Agriculture. Paris, 1851.
Peacock, Captain G. The Resources of Peru. Exeter, 1874.
Pearson, G. On some Ancient Metallic Arms and Utensils. London, 1796.
Pearson, R. On Salted Fish. Reading, 1812.
Penfold, C. On the Rating of Railway Companies. London, 1849.
Pennant, Thomas. Account of London. London, 1791.
———. Arctic Zoology. 3 Vols. London, 1792.
———. Genera of Birds. London, 1786.

Pennant, Thomas. History of the Parishes of Whiteford and Holywell. London, 1796.
———. History of Quadrupeds. 2 Vols. London, 1793.
———. Indian Zoology. London, 1790.
———. Journey from Chester to London. London, 1782.
———. Journey to the Isle of Wight. 2 Vols. London, 1801.
———. Tour in Scotland. 3 Vols. London, 1790.
———. Tour in Wales. 2 Vols. London, 1784.
———. View of Hindoostan. 2 Vols. London, 1798.
———. View of India extra Gangem, China and Japan. London, 1800.
———. View of Malagan Isles, New Holland, and Spicy Islands. London, 1800.
Percival, Robert. Account of Ceylon. London, 1803.
———. Account of Cape of Good Hope. London, 1804.
Perels, E. Die Landwirthschaftlichen Maschinen und Geräthe auf der Weltaustellung zu Paris, 1867. Berlin, 1867.
Pering, R. An Inquiry into the Decay of our Wooden Bulwarks. Plymouth, 1812.
Perron, M. Le Nâcéri. La Perfection des deux Arts, ou Traité complet d'Hippologie et de Hippiatre Arabes. Traduit de l'Arabe d'Abou Bekr Ibn Bedr. Paris, 1852.
Perry, J. G. A Treatise on Rice and Potatoes. London, 1801.
Peters, Matthew. Winter Riches. London, 1771.
Peters, R. Agricultural Inquiries on Plaster of Paris. Philadelphia, 1797.
Petersen, C. Anleitung zum Betriebe der Milchwirthschaft. Dantzig, 1877.
Petzholdt. Die Agrikulturchemie. Leipzig, 1842.
Phillips, G. The Potato Disease. London, 1845.
Peuchet, J. Statistique Élémentaire de la France. Paris, 1805.
Pichat, C. B. Della Coltivazione de Cotone. Turin, 1863.
———. Instituzione Scientifiche e Techniche di Agricoltura. 4 Vols. Turin, 1851–1858.
Pictet, C. Traité des Assolemens. Geneva, 1861.
Pilkinton, W. Natural and Chemical Treatise on Agriculture. Romsey, 1822.
Planting, Treatise on. Dublin, 1794.
Plaw, John. Rural Architectural Designs. London, 1802.
Playfair, Dr. Lyon. Abstract of Professor Liebig's Report on Organic Chemistry. London, 1843.
Plinii Caii. Naturalis Historiæ. 8 Vols. Lipsiæ, 1778.
Plomley, F. Blights of the British Farm arising from Parasitic Fungi. Maidstone, 1851.
Plumptre, Mrs. A. Narrative of a Residence in Ireland. London, 1792.
Poole, The History of the Town and County of. Poole, 1788.
———, Translation of the Charter of, time of Queen Elizabeth. Poole, 1788.
Poor, Rules for the Management of the. London, 1801.
Poor Laws. London, 1817.
Porter, T. C. Synopsis of the Flora of Colorado. Washington, 1874.
Portlock, J. E. Notes on Agricultural Schools. Dublin, 1843.
Potatoes, An Account of the Culture of, in Ireland. London, 1796.
———, The Best Method of Improving. London, 1732.
Potter, W. H. On Guano and Artificial Guano. London, 1842.
Poundley, J. W. Cottage Architecture. Lichfield, 1857.
Pourian, L. F. La Laiterie. Paris, 1874.

Practical Economy. By a Physician. London, 1801.
Practice with Science. A series of Agricultural Papers. 2 Vols. London, 1867.
Presse Agricole, La. Paris, 1846.
Preston, R. A Review of the Present Ruined Condition of the Landed and Agricultural Interests. London, 1816.
———. On the State of the Nation. London, 1816.
Preussen, Abhandlungen zur geologischen Special-Karte von. Berlin, 1877.
Prices of Wheat, Malt, &c., in England, previous to 1765. London, 1768.
Priest, W. Travels in America. London, 1802.
Produce of the Land, On the Principles which should Regulate the Public Encouragement with a view to Increase the Annual. Thirsk, 1844.
Provisions, A Brief Review of the Causes which have operated to Enhance the Price of. London, 1801.
———, A Letter to the Right Hon. William Pitt on the Causes of the High Price of. London, 1795.
———, Inquiry into the Causes and Remedies of the late and present Scarcity and High Price of. London, 1800.
———, Observations on the enormous High Price of. London, 1801.
———, On the High Prices of. London, 1764.
———, Political Speculations, or an Attempt to Discover the Causes of the Dearness of. London, 1767.
———, Reflections on the present High Price of. London, 1766.
———, Reflections on the present Scarcity and High Price of. London, 1801.
———, Report of Committee of the Court of Common Council respecting the High Prices of. London, 1786.
———, Short Thoughts on the present Price of. London, 1800.
———, The Causes of the Dearness of. Gloucester, 1766.
———, Thoughts on the Causes and Consequences of the present High Price of. London, 1800.
———, Thoughts on the Dearness of. Oxford, 1800.
Purdon's Irish Herd-Book. Dublin, 1858.

Quarterly Journal of Agriculture. 27 Vols. 1829–1867. Edinburgh.
Quarterly Journal of Agriculture and Industry. 2 Vols. Dublin, 1848–1849.
Queen's College. Birmingham School of Chemistry. Birmingham, 1839.
Quevenne, A. Du Lait. Paris, 1857.

Raimondi, Antonio. El Perú. Lima, 1874.
Randall, J. Semi-Virgilian Husbandry. London, 1764.
Ransome, J. A. The Implements of Agriculture. London, 1843.
Ransome and May's Catalogue of Agricultural Implements and Machines. Ipswich, 1848.
Raynbird, H. On Measure Work. London, 1847.
Raynbird, W. and H. The Agriculture of Suffolk. London, 1849.
Read, Robert. Treatise on the Use and Abuse of the Flexible Tube or Probang. London, 1845.
Real Associação Central da Agricoltura Portugueza, Jornal da. Lisbon, 1873.
Recenseamento geral dos Gados no Continente do Reino de Portugal em 1870. Lisbon, 1873.
Recueil de Documents sur les Exactions, Vols et Cruautés des Armées Prussiennes en France. Bordeaux, 1871.

Receuil de Mémoires concernant l'Économie Rural, par une Société établie à Berne. 4 Vols. Zurich, 1760.
Redfern, P. Microscopical Examinations of the Thames and other Waters. London, 1852.
Reed, A. A Practical Treatise on Concrete. London, 1873.
Reed, Howard. A few Plain Words to Landowners. London, 1864.
Reid, G. H. An Essay on New South Wales. Sydney, 1876.
Relatorio do Conselho Especial de Veterinaria. Lisbon, 1873.
Relazione della Commissione d'Agricoltura inviata in Inghilterra, 1862. Milan, 1863.
Relazioné intorno alli Condizioni dell'Agricoltura. 3 Vols. Rome, 1876.
Rendle, W. E. England, a Wine Producing Country. London, 1868.
Rennie, R. History and Origin of Peat Moss. Edinburgh, 1810.
Renny, Robert. History of Jamaica. London, 1807.
Renton, G. The Grazier's Ready Reckoner. Berwick.
Report of the Chief Signal Officer to the Secretary of War. Washington, 1873.
Report of the Secretary of War. Washington, 1866.
Resp, An inquiry into the Cause of the. Peterborough, 1811.
Results of Meteorological Observations from 1854–1859. Washington, 1861.
Revista de Agricultura. 2 Vols. Lima, 1875–1876.
Revue Agricole. 1839.
Revue Agricole, Industrielle, et Littéraire. Valenciennes, 1859–1862.
Rham, W. L. Dictionary of the Farm. London, 1844.
Rhodes, G. J. Remarks on the Purchase Value of Landed Property. London, 1853.
Riall, W. H. Milch Cows. Translated from the French of F. Guenon. Dublin, 1851.
Ribeiro, J. S. Historia dos Estabelecimentos Scientificos, Litterarios e Artisticos de Portugal. 3 Vols. Lisbon, 1871.
Ricard, S. Traité général du Commerce. 2 Vols. Amsterdam, 1781.
Richard, A. Précis d'Agriculture. Paris, 1851.
Richardson, H. D. Horses: their Varieties, Breeding, and Management in Health and Disease. Dublin, 1848.
Richardson, Thomas. On the Preservation of Timber. London, 1859.
Rigby, Ed. Holkham: its Agriculture, &c. Norwich, 1818.
———. Italy: its Agriculture. Translated from the French of M. Chateauvieux. Norwich, 1819.
Rigg, Robert. Experimental Researches, Chemical and Agricultural. London, 1844.
Riondet, A. L'Agriculture de la France Meridionale. Paris, 1874.
Roads, The Construction of, on Mechanical and Physical Principles. London, 1774.
Robert, M. L'Influence de la Revolution Française sur la Population. 2 Vols. Paris, 1802.
Roberts, H. Healthy Dwellings. London.
———. H.R.H. Prince Albert's Model Houses for Families. London, 1851.
———. The Dwellings of the Labouring Classes. London, 1850.
———. The Improvement of the Dwellings of the Labouring Classes. London, 1859.
Roberts, R. The Essentials of a Healthy Dwelling. London, 1862.
Robertson, H. Natural History of the Atmosphere. 2 Vols. London, 1808.
Robinson, J. Letter to Sir John Sinclair on Waste Lands. London, 1794.

Robison, John. Mechanical Philosophy. Edinburgh, 1804.
Rolnicze, W. K. Rogzniki Gospodarstwa Krajowego. 4 Vols. Warsaw, 1858–1861.
Romand, H. Études sur les Colonies Agricoles. Paris, 1851.
Romao, Visconde de V. des. Manual Pratico da Cultura das Patatas. Lisbon, 1845.
Ronna, A. Les Industries Agricoles. Paris, 1869.
———. Rothamsted. Trente Années d'Expériences Agricoles de MM. Lawes et Gilbert. Paris, 1877.
Rose, Rt. Hon. G. A Letter respecting a Naval Arsenal. London, 1810.
———. On Public Expenditure and the Influence of the Crown. London, 1810.
———. On the Poor Laws. London, 1805.
Rotation of Crops. Philadelphia, 1796.
———. Phildelphia, 1792.
Rothe, A. Handbuch für den angehenden Landwirth. Berlin, 1841.
Rowlandson, Thos. Report on a New Water-Supply to the Metropolis. London, 1851.
Rowley, R. On the Improvement of the Agriculture of North Derbyshire. Chesterfield, 1849.
Royal Agricultural Improvement Society of Ireland. Premiums for the Cattle Show at Cork, 1850.
Royal Agricultural Society of England, Journal of the. Series I., Vols. 1–25. Series II., Vols. 1–13. London, 1840–1877.
Royal Agricultural Society of Jamaica. Transactions. Kingston, 1844.
Royal College of Chemistry. Reports, &c. London, 1847.
Royal College of Veterinary Surgeons. Fourth Annual Report. London, 1847.
———, Register, Charters, Bye-laws, &c., of the. London, 1877.
Royal Dublin Society's Journal. 4 Vols. Dublin, 1856–1865.
Royal Dublin Society. Report of Meeting for the Announcement of the Prizes. Dublin, 1851.
Royal Jersey Agricultural Society. Seventeenth Annual Report. Jersey, 1851.
Royal North Lancashire Agricultural Association. Discussion on Drainage. Preston, 1848.
Royal Society, Philosophical Transactions of the. 43 Vols. London, 1665–1800 (abridged), 1800–1816 (unabridged).
Royal Society for Promotion of the Growth of Flax in Ireland. Eighth Annual Report. Belfast, 1849.
Royer, C. E. Institutions de Crédit Foncier et Agricole en Allemagne et en Belgique. Paris, 1845.
———. L'Agriculture Allemande. Paris, 1847.
———. Notes économiques sur l'Administration des Richesses, et la Statistique Agricole de la France. Paris, 1843.
Rozier, L'Abbé. Cours d'Agriculture. 10 Vols. Paris, 1797.
Rubichon and Monnier, Review of the work of, on "L'Action de la Noblesse et des Classes Supérieures dans les Sociétés Modernes." London, 1848.
Ruffin, E. Agricultural Essays. Richmond, Va., 1855.
———. Agricultural Survey of South Carolina. Columbia, 1843.
———. Calcareous Manures. Petersburg, Va., 1832.
———. Ditto. Richmond, Va., 1852.
———. Ditto. Shellbanks, 1835.
———. The Bank Reformer. No. 1–6. Petersburg, Va., 1841, 1842.
Ruggles, T. The History of the Poor. London, 1797.

Rumford, Count. Essays, Political, Economical, and Philosophical. London, 1800.
Russell, James. Practical and Chemical Agriculture. Leamington, 1840.
Russell, Lord John. Speech on National Education. London, 1839.
Russell, Robert. North America, its Agriculture and Climate. Edinburgh, 1857.
Ryan, John. The First Principles of Artificial Manuring. London, 1849.
Rydge, John. Veterinary Surgeon's Vade Mecum. London, 1827.

Sachsen, Amtlichen Bericht über die erste general Versammlung der Landwirthe aus den Provinz. Halle, 1844.
Sainbel, Ch. V. de. Elements of the Veterinary Art. London, 1797.
Salisbury, William. Botanist's Companion. 2 Vols. London, 1816.
Samuel, Brothers. Wool and Woollen Manufactures. London, 1859.
Sandford, J. Farm Ledger, or Stock Book (specimen). London, 1849.
———. Farm Purchase Book (specimen). London, 1849.
———. Farm Sale Book (specimen). London, 1849.
———. Weekly Transactions of the Farm Book (specimen). London, 1849.
Savings Banks, Annals of. London, 1818.
Scheme for making Permanent Settlements on the Veteran Soldiers, by Cultivating the Waste Lands of the Crown. London, 1797.
Scheuchzero, J. Operis Agrostographici. Figuri, 1719.
Schleiden, J. M. Die Pflanzenphysiologie. Leipzig, 1842.
———. Ueber Liebig's Theorie der Pflanzenernährung. Leipzig, 1842.
Schübeler, F. C. Die Pflanzenwelt Norwegens. Christiania, 1873.
Schumann, J. Faareavl og Landbovilkaar i Norges Kystland. Bergen, 1874.
———. Udgangerfaaret i Skotland og Norge. Bergen, 1876.
Schweitzer, Dr., and H. W. Pabst. Die Versammlung deutscher Landwirthe zu Dresden 1837. Leipzig, 1838.
Science Conferences Reports. 2 Vols. London, 1876.
Scientific and Practical Agriculturist, The. No. 1. London, 1844.
Scotland, General Report of Agriculture of. 5 Vols. Edinburgh, 1814.
———, Statistical Account of. 21 Vols. Edinburgh, 1795.
Scots Farmer, The. Edinburgh, 1773.
Scott, Thomas. Ireland as a Field for Investment. London, 1854.
Selby, P. J. History of British Forest Trees. London, 1842.
Selkirk, Earl of. Highlands of Scotland. Edinburgh, 1806.
Sellon, J. On the Depreciation of Landed Property. London, 1816.
Seringe, N. C. Le petit Agriculteur. Paris, 1841.
———. Monographie des Céréales de la Suisse. Berne, 1819.
Shannon Commission Reports. 3 Vols. Dublin, 1839.
Shaw, W. Thaër's Principles of Agriculture. 2 Vols. London, 1844.
Sheep, On the Different Breeds of. Edinburgh, 1792.
———. Their Breeds, Management, and Diseases. London, 1837.
Sheffield, Right Hon. Lord. On the Corn Laws. London, 1815.
———. On the Impolicy and Abuses of the Poor Laws. London, 1818.
———. On the Necessity of Inviolably Maintaining the Navigation and Colonial System of Great Britain. London, 1804.
———. Remarks on the Deficiency of Grain. Parts 1, 2, and 3. London, 1800, 1801.
Sheppard, J. H. On Peruvian and Ichaboe African Guano. Liverpool, 1844.
Shier, J. Report of the Agricultural Chemist to the Colony of British Guiana. Demerara, 1847.

Shirreff, Patrick. Improvement of the Cereals, and an Essay on the Wheat-Fly. Edinburgh, 1873.
Short, J. K. An Essay on the Agriculture of the West Riding of Yorkshire. London, 1849.
Sibson, A. Agricultural Chemistry. London, 1858.
———. Agricultural Chemistry. London, 1867.
Sidenbladh, Dr. E. Swedish Catalogue of the International Exhibition 1876. Philadelphia.
Simonde, J. C. L. La Richesse Commerciale. 2 Vols. Geneva, 1803.
———. Tableau de l'Agriculture Toscane. Geneva, 1801.
Simonds, J. B. Present Condition of Veterinary Medicine. London, 1852.
———. Small Pox in Sheep. London, 1848.
———. The Age of the Ox, Sheep, and Pig. London, 1854.
Sinclair, George. Grasses and Weeds. London, no date.
———. Hortus Gramineus Woburnensis. London, 1816.
Sinclair, Sir J., Bart. Address to the Society for the Improvement of British Wool. Edinburgh, 1791.
———. History of the Public Revenue. 3 Vols. London, 1803.
———. Husbandry of Scotland. Edinburgh, 1812.
———. Specimens of Statistical Reports. London, 1793.
Skellett, E. Parturition of the Cow. London, 1811.
Skilling, Thomas. The Farmer's Ready Reckoner. Dublin, 1844.
———. The Science and Practice of Agriculture. Dublin, 1846.
Smalian, H. L. Anleitung zur Untersuchung des Waldzustandes. Berlin, 1840.
Small's Veterinary Tablet. Glasgow, no date.
Smith, Adam. Wealth of Nations. 3 Vols. London, 1799.
Smith, E. The Peasant's Home. London, 1876.
Smith, J. E. Flora Britannica. 2 Vols. London, 1800.
Smith, W. On Water Meadows, Draining, and Irrigation. London, 1806.
Smithsonian Contributions to Knowledge, 17 Vols. Washington, 1860–1876.
Smithsonian Institution, Reports of. 17 Vols. Washington, 1860–1876.
Soane, John. Sketches in Architecture. London, 1798.
Sociedad Rural Argentina, Añales de la. 9 Vols. Buenos Aires, 1867–1876.
Società Agraria di Bologna, Annali della. 4 Vols. Bologna, 1855–1859.
———, Memorie della. 4 Vols. Bologna, 1855–1859.
Società Agraria di Gorizia, Atti e Memorie. Gorizia, 1876.
Società Agraria di Lombardia, Giornali ed Atti. Milan, 1864, 1865.
Società d'Incoraggiamento in Padova, Rassegna di Agricoltura, &c. Padova, 1873.
Société Agricole, Scientifique et Litteraire des Pyrénées-orientales. Perpignan, 1873.
Société Centrale d'Agriculture de Belgique, Journal de la. Brussels, 1856–1874.
Société Centrale d'Agriculture de France, Bulletin des Séances. 5 Vols. Paris, 1873–1877.
Société d'Agriculture d'Alger, Exposition Générale des Produits. Alger, 1875.
Société d'Agriculture, de Commerce, et des Arts, établie par les États de Bretagne, Corps d'Observations de la. Rennes, 1760.
Société d'Agriculture, Sciences, et Arts de Meaux, Compte rendu de la Séance à Rentilly. Meaux, 1876.
———, Compte rendu de la Séance à Thieux. Meaux, 1870.
———, Publications de la. Meaux, 1863–1875.

Société d'Agriculture, Sciences, et Arts de Meaux, Rapport de la Commission du Voyage en Angleterre. Meaux, 1852.
Société d'Assurance contre la Mortalité des Chevaux et des Bestiaux servant à l'Agriculture, Statuts de la. Brussels, 1838.
Société des Agriculteurs de France, Bulletin de la. 2 Vols. Paris, 1876, 1877.
———, Comptes rendus des Travaux de la. 4 Vols. Paris, 1869–1877.
Société des Arts de Genève. Bulletin de la Classe d'Agriculture. 15 Vols. Geneva, 1822–1868.
Société Économique de Berne. Memoires et Observations. Berne, 1767.
Société Générale des Naufrages et de la Marine, Journal de la. Paris, 1838.
Société Impériale d'Agriculture d'Alger. Bulletin des Travaux. Alger, 1864.
Société Impériale d'Agriculture, Sciences, et Arts de Valenciennes. Revue Agricole. 2 Vols. Valenciennes, 1865–1877.
Société Impériale d'Économie Rurale de Moscow. Fête Jubilaire. Moscow, 1846.
Société Impériale Zoologique d'Acclimitation, Bulletin de la. Paris, 1854–1868.
Société Nationale et Centrale d'Agriculture, Programme des Concours. Paris, 1848.
Société Royale Agricole de l'Est de la Belgique, Journal de la. Verviers, 1874.
Société Royale d'Agriculture de Guernsey, 9ème Rapport Annuel. Guernsey, 1851.
Société Royale d'Agriculture de Lyon, Annales de la. 10 Vols. Lyon, 1838–1847.
Société Royale d'Agriculture de Paris, Mémoires de la. 3 Vols. Paris, 1786–1788.
Société Royale d'Agriculture et de Botanique de la Ville de Gand. XVIIme Exposition Publique. Gand, 1817.
Société Royale d'Agriculture et de Commerce de Caen, Précis des Travaux. 3 Vols. Caen, 1820–1844.
Société Royale de Paris, Mémoires d'Agriculture par la. Paris, 1785.
Société Royale des Sciences, de l'Agriculture, et des Arts de Lille, Mémoires de la. 5 Vols. Paris, 1843–1847.
Société Royale et Centrale d'Agriculture, Extrait du Compte rendu de la. Paris, 1845.
Society for Improving the Condition of the Labouring Classes, Sixth Annual Report. London, 1850.
Society for the Diffusion of Useful Knowledge, Address to the Committee. London, 1846.
Society for the Encouragement of Agriculture in Dumfries, Transactions of the, 1770.
Society for the Promotion of the Growth of Flax in Ireland, Proceedings of the. Belfast, 1842.
Society of Arts, Journal of the. 25 Vols. London, 1853–1877.
———, Transactions of the. 4 Vols. London, 1820–21.
Soils and Manures. London, 1818.
Solly, Edward. Rural Chemistry. London, 1843.
Somerville, Lord J. On Wool, Sheep, &c. London, 1809.
———. Produce of Sheep, Wool, &c. London, 1800.
Southampton, Map of Town and Environs.
Southern Magazine. Petersburg, Va., 1840.
Southey, T. On Sheep. London, 1840.

Spallanzi, L. Nature of Animals and Vegetables. 3 Vols. Edinburgh, 1799.
Spannocchi, Silvio. Due Discorsi circa l'Agricoltura. Siena, 1626.
Spence, W. Address at the Anniversary Meeting of the Entomological Society. London, 1849.
Spooner, L. H. On the Decay among the Potatoes. London, 1845.
Spooner, Professor. Introductory Lecture delivered at the Royal Veterinary College. London, 1850.
———. The Foot of the Horse. London, 1840.
Sprengel, Dr. C. Pflanzen-Cultur. Leipzig, 1847.
Sproule, John. Irish Farmer's Journal. Dublin, 1843.
Sproule, J. On the Growth and Management of Flax in Ireland. Dublin, 1844.
Squarey, Charles. Agricultural Chemistry. London, 1842.
Stanley, Right Rev. E., Bishop of Norwich. Heads for the Arrangement of Local Information in every Department of Parochial and Rural Interest. London, 1848.
State Board of Agriculture. Annual Reports. 2 Vols. Topeka, Kansas, 1874, 1875.
———. Ditto. Centennial Edition. Topeka, Kansas, 1876.
State of the Country since the Peace. London, 1817.
State of the Population, Poor and Poor Rates. London, 1805.
Statistical Surveys of Ireland. 25 Vols. Dublin.
Statistics of the Foreign and Domestic Commerce of the United States. Washington, 1864.
Stele, J. On Making Butter and Cheese. Glasgow, 1794.
Stephens, Henry. Book of the Farm. 3 Vols. Edinburgh, 1844.
———. Book of the Farm. 2 Vols. Edinburgh, 1871.
———. The Book of Farm Implements and Machines. Edinburgh, 1858.
Stevenson, D. On the Reclamation and Protection of Agricultural Land. Edinburgh, 1874.
Stevenson, J. W. The Cottage Homes of England. London, 1851.
Stewart, J. Advice to Purchasers of Horses. Glasgow, 1837.
Stewart, James. Political and Metaphysical Works. 6 Vols. London, 1805.
Stewart, John. Account of Prince Edward's Island. London, 1806.
Stuart, Sir J., Bart. Uniformity of Weights and Measures. London, 1790.
Stickney, W. On the Grub. Hull, 1800.
Stöckhardt, Dr. A. Eine agriculturchemische Reise.
Stockholm, Map of: showing the nature of the Country, &c. Stockholm, 1871.
Stokes, J. On the Management of Sheep. Stourbridge, 1845.
Stone, Thomas. Essay on Agriculture. Lynn, 1785.
Stummers Ingenieur. Vienna, 1875.
Sturt, C. The Real State of France in the Year 1809. London, 1810.
Sturtevant, E. L. Milk: its Typal Relations, &c. South Framingham, Mass., 1874.
Suffolk and Norfolk Herd Book. Norwich, 1875.
Surrey Agricultural Society. Rules and Premiums. Guildford, 1808.
Sussex, F. S. M. de. On Manures. Dorking, 1848.
Svenska Landbrukts Akademien, Handlingen af. 9 Vols. Stockholm, 1865–1873.
Swedish and English Dictionary. Leipzig, 1869.
Swinburne, R. The Farmer's Complete Account Book. Colchester, 1846.

Swinburne, R. The Farmer's Field Register Book. Colchester, 1845.
———. The Bailiff's Account Book. Colchester, 1845.
Symes, M. Account of Embassy to Kingdom of Ava. London, 1800.
Systema Agriculturæ; or, Mystery of Husbandry. London, 1681.

Tabac, Culture du. Brussels.
Taplin, William. System of Farriery. 2 Vols. London, 1806.
Tatham, E. On the Scarcity of Money. Oxford, 1816.
Tatham, W. National Irrigation. London, 1801.
———. Remarks on an Essay on the Comparative Advantages of Oxen for Tillage in Competition with Horses. London, 1801.
Taxation, A Letter on. London, 1818.
Taylor, J. Improved Edition of Haddon's Farmer's Complete Account Book. Colchester.
Teissier, M. Maladie des Grains. London, 1753.
Templemoyle Agricultural Seminary, Report of the. Londonderry, 1836.
Tenant Farmers, Hints to. London, 1849.
Tessier, M. Annales de l'Agriculture Française. Paris, 1838.
Thénard, M. le Baron P. Discours au Comice Agricole de Fontaine-Française. Dijon, 1862.
———. Discours au Comice Agricole de Fontaine-Française. Paris, 1864.
———. Mémoire sur les Combinaisons du Phosphore avec l'Hydrogène. Paris, 1845.
Thesen, O. Om Dyrskuer og Udstillingsdyr. Christiania, 1874.
Thomas, Ernest. Le Marché aux Bestiaux de la Villette et les Abattoirs de Paris. Paris, 1873.
Thompson, B. The Introduction of Merino Sheep. Translated from the French of C. P. Lasteyrie. London, 1810.
Thomson, J. Grain Tables. Edinburgh, 1777.
Thomson, R. D. Experimental Researches on the Food of Animals. London, 1846.
Thorold, W. Present and Future Prospects of Farming in Great Britain. London, 1849.
Tibbs, Thomas. The Experimental Farmer. London, 1807.
Tidskrift for Landmand. 12 Vols. Christiania, 1864–75.
Tillage Lands, On a Change of System in Cultivating. Worcester, 1810.
Tilley, T. G. Agricultural Chemistry for Practical Purposes. Chelmsford, 1843.
Tinseau, Chev. de. Statistical View of France. London, 1803.
Tolls, On the Assessment of, as a Public Revenue. Edinburgh, 1797.
Towers, John. The Domestic Gardener's Manual. London, 1839.
Townley, J. The Diseases, Regeneration, and Culture of the Potato. London, 1847.
Treffry, R. A Dissertation on Smut Balls amongst Wheat and other Grain. Haydon, 1793.
Tréhonnais, F. R. de la. Revue Agricole de l'Angleterre. 5 Vols. Paris, 1859–1863.
Trimmer, J. K. On the Present State of Agriculture in the South of Ireland. London, 1809.
———. Further Observations on ditto. London, 1812.
———. On Guano. London, 1843.
Trowell, S. The Farmer's Instructor. London, 1747.
Tuckett, J. D. On Cultivating Waste Lands, London, 1843.
Tuke, John. Agriculture of the North Riding of Yorkshire. London, 1800.

Tull, Jethro. Principles of Vegetation and Tillage. London, 1751.
Turbilly, Marquis de. Discourse on the Cultivation of Waste Lands. Translated from the French. London, 1762.
Turner, James. The Foot of the Horse. London, 1832.
Turner's Elements of Chemistry. London, 1840.
Tuson, R. V. Veterinary Pharmacopœia. London, 1869.
Twamley, J. Dairying Exemplified; or the Business of Cheese-Making. Warwick, 1787.

Ueber-Bayerns Landwirthschaftliche Zustände. Munich, 1844.
Unger, Dr. Grundzüge der Anatomie und Physiologie. Vienna, 1846.
Unterricht über den Kleebau und die Stallfutterung. Hanover, 1794.
Upper Canada, Transactions of the Board of Agriculture of. 2 Vols. Toronto, 1856–1858.
Ure, A. Dictionary of Arts, Manufactures, and Mines. 3 Vols. London, 1872.
Uruguay, Comision Central de Agricultura de la República del. Boletin Oficial. Montevideo, 1877.

Valcarcel, J. A. Agricultura General. 4 Vols. Valencia, 1765.
Vancouver, John. An Inquiry into the Causes and Production of Poverty and the State of the Poor. London, 1796.
Vanderstaeten, J. Improved Agriculture. London, 1816.
Vanderstegen, W. Frauds in the Collection of the Salt Duties. Reading, 1793.
Vansittart's Speech on Additional Churches. London, 1818.
Varlo, C. New System of Husbandry. London, 1774.
Varnhagen, F. L. G. de. Manuel de Instrucçoes Practicas. Lisbon, 1836.
Vaughan, W. On Sheep. London, 1813.
Vegetable Philosophy, A New Theory of. Edinburgh, 1847.
Vegetation, Hints on. London, 1796.
Verhandlungen der K. K. Landwirthschafts-Gesellschaft in Wien. 6 Vols. Vienna, 1832–1843.
Verhandlungen des Naturhistorisch-Medicinischen Vereins zu Heidelberg. Heidelberg. 1876.
Verplancke, J. A. Description de la Culture de la Garance. Brussels, 1835.
———. Instruction pour la Culture de la Garance. Brussels, 1837.
Versammlung. Land- und Forstwirthe zu München 1844. Munich, 1845.
Veterinary Medical Association, Proceedings of the. 6 Vols. London, 1836–1842.
Veterinary Review. 5 Vols. Edinburgh, 1858–1863.
Veterinary Surgeons, Copy of Charter to the Royal College of. London, 1852.
Vétillart, M. Sur La Culture du Pin Maritime. Paris, 1835.
Victoria. Department of Agriculture, Reports of. 2 Vols. Melbourne, 1873, 1874.
Vienna Exhibition. Official Reports. 4 Vols. London, 1873.
Villa-Maior, Visconde de. Tratado de Vinificação. 2 Vols. Lisbon, 1865–1869.
Ville, G. École des Engrais Chimiques. Paris, 1869.
Vines, R. Diseases of the Horse. London, 1834.
———. Practical Treatise on the Horse. London, 1834.
Virginia School Report. Richmond, U.S.A., 1874.
Vivian, Richard. A Letter on Friendly Societies and Savings' Banks. London, 1816.

Voelcker, Dr. A. Four Lectures on Farm-Yard Manure, Artificial Manures Barren and Fertile Soils, Oil Cakes, &c. London, 1857.
Vogel, M. On Beer. London, 1874.
Volney, C. F. View of America. London, 1804.

Wade, W. Artificial or Sown Grasses. Dublin, 1808.
———. Meadow and Pasture Grasses. Dublin, 1808.
Wahlberg, F. Anvisning till Svenska Fodervächternas Kännedom. Stockholm, 1835.
Walker, John. History of the Hebrides. Edinburgh, 1808.
Walker, J. C. Report on Improvements in the Dwellings and Condition of Agricultural Labourers in Scotland. Edinburgh, 1860.
Walker's Map of the Geology, Railways, &c., of England and Wales and South of Scotland.
Wallis, John. Dendrology. London, 1835.
Wankel, G. Beretning om Nogle Landrugschemiske Undersogelsen ved aas hoiere Landbrugsskole af A. Rosing. Trondhjem, 1870.
Warnes, John. Cultivation of Flax. London, 1846.
———. Extracts from Ancient and Modern Writers on the Flax Crop. London, 1846.
———. Reasons for the Cultivation of Flax. London, 1843.
———. Suggestions on Fattening Cattle with Native instead of Foreign Produce. London, 1843.
Warren, J. The Farmer's Account Book. Royston, 1841.
Wastes in general, and Mosswold in particular. Norwich, 1792.
Watson, H. C. The Geographical Distribution of British Plants. London, 1835.
Watts, Henry. A Dictionary of Chemistry. 6 Vols. London, 1872.
Weaver, H. Hints on Cottage Architecture. Bath, 1848.
Webb, S. H. The Practical Farmer's Yearly Account Book. Norwich, 1846.
Weckerlin, A von. Die landwirthschaftliche Thier-Produktion. Stuttgart, 1851.
Wells, E. F. Etchings of the Four Most Esteemed Breeds of Cattle. 1850.
———. Etchings of Large Heads of Cows. 1852.
———. Portraits of Smithfield Prize Cattle. London, 1841, 1842.
Wells, John. On Flax Cultivation. Doncaster, 1847.
Wells, S. On the Bedford Level. 2 Vols. London, 1830.
Wells, W. C. On Dew. London, 1815.
West, J. On Turnips. Newark, 1841.
West Derby Agricultural Society. Rules, &c. Liverpool, 1801.
Western Agriculturist, No. 1. Axminster, 1844.
Weston, R. Agriculture and Gardening. London, 1772.
Wharton, Rev. G. On Bettering the Condition of the Agricultural Labourer. Stourbridge, 1845.
Wheat, Malt, &c., Prices of, in England from 1000 to 1765. London, 1768.
Wheeler, James. The Modern Druid. London, 1747.
Whitaker, John. The History of Manchester. 2 Vols. London, 1771.
White, John. The Indigenous Grasses of Ireland. Dublin, 1808.
White, W. England's True Wealth. London, 1849.
Whitehead, C. On Night Schools. London, 1865.
Whitlaw, Charles. Medical System of Linnæus. London, 1829.
Whitney J. D. Lake Superior. Washington, U.S.A., 1851.
Whitworth, R. P. New South Wales Gazetteer. Sydney, 1866.
Wicksteed, T. London Sewage Company, Report on the Plans proposed for rendering available the Metropolis Sewage as Manure. London, 1845.

Wight, A. Husbandry in Scotland. 4 Vols. Edinburgh, 1877.
Wight, W. L. On Vegetable and Animal Physiology. Petersburg, U.S.A., 1843.
Williams, John. Climate of Great Britain. London, 1806.
Williams, J. A. Steam Cultivation. London, 1858.
Williams, W. The Principles and Practice of Veterinary Medicine. Edinburgh, 1874.
Williamson, Thos. Agricultural Mechanism. London, 1810.
Willis, Rev. J. On the Poor Laws. London, 1808.
Wilson, Dr. A. The Colorado Beetle. London, 1877.
Wilson, Rev. J. M. Rural Cyclopædia. 4 Vols. Edinburgh, 1847.
Wimpey, T. Rural Improvements. London, 1795.
———. Thoughts on Exportation of Corn, Prices of Provisions, on Manufactures, &c. London, 1770.
———. A defence of the foregoing Pamphlet. London, 1770.
Winch, Henry. The Agricultural Holdings Act. London, 1875.
Winkfield School of Industry. Rules and Regulations. Windsor, 1839.
Winter George. System of Husbandry. London, 1797.
Wisconsin, its Natural Resources and Industrial Progress. Madison, U.S.A., 1874.
Wisconsin Academy of Sciences, Arts, and Letters, Report of the. Madison, U.S.A., 1874.
Wisconsin State Agricultural Society, Reports of the. 11 Vols. Madison, U.S.A., 1851–1873.
Wissett, R. Treatise on Hemp. London, 1808.
Withering, William. British Plants. 4 Vols. Birmingham, 1796.
Wolfius, Dr. A Discovery of the True Cause of the Wonderful Multiplication of Corn. London, 1734.
Wolowski, M. Notice sur M. Monny de Mornay. Paris, 1870.
Wood, George. The Isle of Man. London, 1811.
Woods, H. Breeding and Management of Sheep. London, 1864.
———. The Diseases of Sheep. London, 1873.
Wool, An Inquiry into the Nature and Qualities of English. London, 1782.
———, Observations on British and Foreign. London, 1731.
Woolhouse, W. S. B. Measures, Weights, and Money. London, 1872.
Wright, Sir James. Preservation of Wheat from Vermin. London, 1796.
Wright, W. The Application of Electricity and Galvanism. London, 1848.
———. The Closure, or Obstruction, of the Eustachian Tube. London, 1849.
Wurstemberger, L. von. Die gegenwartigen Agrarverhältnisse Russlands. Leipzig, 1873.

Yelloly, J. The Employment of Spade Husbandry. London, 1838.
Yorkshire Agricultural Society, Proceedings of. 3 Vols. London, 1837–1850.
Youatt, W. The Pig. London, 1847.
Young, Arthur. Annals of Agriculture. 49 Vols. London, 1786–1808.
———. An Idea of the Present State of France. London, 1795.
———. An Inquiry into the Present State of the Public Mind. London, 1798.
———. Farmer's Calendar. London, 1704.
———. Farmer's Letters to the People of England. 2 Vols. London, 1768.

Young, Arthur. National Danger, and the Means of Safety. London, 1797.
———. Rural Economy. London, 1773.
———. The Cultivation of Beans. Worksop, 1843.
———. The Example of France, a Warning to Great Britain. London, 1794.
———. The Question of Scarcity Plainly Stated. London, 1800.
———. The Rise of Prices. London, 1815.
———. Tour in Ireland. 2 Vols. London, 1772.
———. Tour through East of England. 4 Vols. London, 1771.
———. Tour through North of England. 4 Vols. London, 1771.
———. Tour through South of England. London, 1772.
———. Travels in France. 2 Vols. London, 1794.
Young, Thomas. A Course of Lectures on Natural Philosophy and the Mechanical Arts. 2 Vols. London, 1807.
Yvart, A. Sur la Race Mérinos. Paris, 1850.

Zeitschrift des Landwirthschaftlichen Vereins in Bayern. 5 Vols. Munich, 1868–1875.
Zeller, Dr. Plans of Farm Buildings. Darmstadt, 1843.
Ziegler, A. Die Seidenzucht. Regensburg, 1842.
Zöller, Dr. Die Chemie in ihrer Anwendung auf Agricultur und Physiologie von Justus von Liebig. Brunswick, 1875.

JOURNAL

OF THE

ROYAL AGRICULTURAL SOCIETY
OF ENGLAND.

XVI.—*Sutherland Reclamation.* By Charles Gay Roberts, of Haslemere, Surrey.

The last volume of this Journal contained two reports on reclamations effected, one in England and the other in Ireland. The important reclamations in the north of Scotland which I have now to notice differ from the other two, not only in the extent of their area and the magnitude of their cost, but still more in this respect that, while those works were single and independent undertakings that might fairly be considered simply upon their own merits, the work that is being done by his Grace the Duke of Sutherland is undertaken for the benefit of the whole county. It cannot, therefore, be rightly estimated as an isolated performance, or as a series of agricultural achievements, but must be considered also as it affects the system of farming hitherto pursued in the county.

Before entering on the details of the work done, it will be convenient, therefore, to glance briefly at the past history and the present state of rural economy in Sutherland.

The county of Sutherland is nearly of a square form, about 60 miles in breadth, and 50 miles from north to south. Occupying the extreme north-western corner of Scotland, it is bounded on the west by the Atlantic, and on the north by the Northern Ocean. The warm current of the Gulf Stream, sweeping along these coasts, affects the climate of the whole county. The county of Caithness forms its eastern boundary. On the south-east it is washed by the Moray Firth, and on the south it is bounded by the Dornoch Firth and the county of Ross. Two-thirds of its circumference is thus washed by the ocean, while its coast-line is broken by salt-water lochs running far into the interior. The evaporation from the ocean and from the great lochs of fresh as well as of salt water, causes a dampness at all seasons of the year, more favourable to the growth of grass than of cereal crops.

The earliest history of the county, written by Sir Robert Gordon, in 1630, states that Sutherlandshire was "mair suitable for bestiall than cornes." The greater part of the interior consists of a succession of mountains, moors, and bogs; and in no other county in Scotland is there so small a proportion of the whole area under cultivation. Out of a total acreage of 1,207,188, only 28,711 acres are under cultivation. The prevalent rocks throughout the county are gneiss and mica-schist, yielding a soil very deficient in the elements of fertility; and it is only along the south-eastern coast that a naturally fertile soil is found, resting upon the Old-red-sandstone and Oolitic formations. It is here that the chief part of the arable land is found. Until very recent times no attempt was made to overcome the natural wildness of the country. At the beginning of this century the bridge at Brora, of 24 feet span, was literally the only one in a county intersected by innumerable rivers and streams. The coast-side road was only recognisable by its ruts and the greenness of its surface; while the inland communication was almost exclusively confined to those who could endure the toil of long journeys on foot, and of frequent wading of mountain streams that are often converted by a few hours of rain into impassable torrents.

Thus isolated from the rest of the kingdom, the people, while yielding a loyal obedience to their chief, knew but little of the power of the Crown. The wealth of the Earls of Sutherland consisted chiefly in the number of men that they could summon to attend them in their frequent contests with neighbouring chiefs. Long after the southern highlands, with greater facilities of intercourse, had made great advances in civilization, the Earls of Sutherland derived the means of maintaining their station chiefly from raising for the service of Government a "family regiment," of troops no longer needed for the prosecution of local feuds. The ranks of this regiment (Sutherland Fencibles, now 93rd Regiment) were filled, partly by those who held land jointly in townships directly from the chief, and partly by those who were subtenants of the tacksmen, local magnates who each claimed kindred with the chief, and paid to him the bulk of their rent in feudal service, expecting that their sons and nephews should receive promotion according to the number of recruits they furnished to the regiment.

The tacksmen sublet, at exorbitant rates, a certain portion of their land. They also exacted service from their tenants, and thus lived almost, or quite, rent-free, saving themselves from all regular industry or exertion by stipulating that their immediate dependants should perform for them all the work required on their farms—the ingathering of harvest, the grinding of corn, and

the saving of peat for fuel. In the townships the land was held "run rig," like common field-land in England, but in smaller plots. The total rent was determined by the factor. A jury of elders classed the land according to its quality, and each class was then divided into as many lots as there were occupiers. Each tenant thus held several little isolated plots, and enjoyed a right of pasturage over the common hill-pasture in proportion to the extent of his tillage-land. The effect of this system was that, at the base of many of the mountains, and in every glen, there lived a race of hardy but not industrious crofters. Precarious crops of oats, bere, and potatoes were raised, chiefly by the labour of the women, the men being averse to any regular work, and spending much of their time either in pursuit of game or in idleness.

Mr. James Loch, the commissioner of the estate, writing in 1820, gives the following description of the cottages commonly to be found throughout the county at the beginning of the century. "Their huts were of the most miserable description. They were built of turf dug from the most valuable portions of the mountain sides. Their roof consisted of the same material, which was supported upon a rude wooden frame constructed of crooked timber taken from the natural woods belonging to the proprietor, and of moss fir dug from the peat bogs. The situation they selected was uniformly on the edge of the cultivated land and of the mountain pastures. They were placed lengthways, and sloping with the declination of the hill. This position was chosen in order that all the filth might flow from the habitation without furthur exertion upon the part of the owner. Under the same roof, and entering at the same door, were kept all the domestic animals belonging to the establishment. The upper portion of the hut was appropriated to the use of the family. In the centre of this upper division was placed the fire, the smoke from which was made to circulate throughout the whole hut, for the purpose of conveying heat to its furthest extremities; the effect being to cover everything with a black glossy soot, and to produce the most evident injury to the appearance and eyesight of those most exposed to its influence. The floor was the bare earth, except near the fire-place, where it was rudely paved with rough stones. It was never levelled with much care, and it soon wore into every sort of inequality, according to the hardness of the respective soils of which it was composed. Every hollow formed a receptacle for whatever fluid happened to fall near it, where it remained until absorbed by the earth. It was impossible that it should ever be swept; and, when the accumulation of filth rendered the place uninhabitable, another hut was erected in the vicinity of

the old one. The old rafters were used in the construction of the new cottage, and that which was abandoned formed a valuable collection of manure for the next crop."

Such dwellings were not confined to the remoter part of the estate. The thriving, well-built town of Golspie, close to Dunrobin Castle, the ducal residence, was but a collection of black huts in the year 1812.

The crofters conducted their tillage in the most primitive manner. Drainage was unknown; mildew and early frost, occurring every third or fourth year, injured their crops; the introduction of potatoes, while it enabled a denser population in a good season to find sustenance with less labour, greatly added to their misery whenever the crop failed.

Famines occurred more and more frequently; and, in spite of liberal distributions of meal and the remission of their rents by their landlords, the people endured at such periods the extremity of human misery. Many left their hills to gather cockles on the coast, others sustained life upon nettle-broth, and those who had cattle bled them and mixed the blood with oatmeal, which they cut in slices and fried for food. The Marquis of Stafford, afterwards the first Duke of Sutherland, and Lady Stafford, who was Countess of Sutherland in her own right, after spending a large sum in temporary relief, determined upon a scheme for the permanent benefit of the people and the improvement of the estate. They removed the crofters from their inland glens and townships and settled them upon the coast, giving each family, at a low rent, sufficient land for their support. Facilities were afforded them to join in the herring fisheries, then rising in importance, while it was hoped that they would also prosecute the cod and ling fishery. Although this compulsory migration could not be effected without violating that passionate love of home that dwells in the hearts of every mountain race, there is no doubt that the severity of the remedy was fully justified by the gravity of the case. But for this step there is every reason to believe that the famines in Sutherland would have culminated in sufferings not a whit less intense than those of Ireland in 1847.

The removals were commenced in 1807, and completed in 1819. Two of the worst years of famine occurred during the period of transition, viz. in 1812–13, and in 1816–17; since that time famine has been unknown. Although the ling and cod fisheries have not been pursued with any vigour, most of the able-bodied men have joined in the herring fishery, thus obtaining an increase of income independent of the annual produce of their crofts.

In the time of greatest suffering, relief-works were started

that gave the first great impetus to progress in the county. The want of access and of the means of external and internal communication had hitherto prevented the entrance and advance of the arts of civilization. In the year 1803 an Act was passed by which Government offered to advance one-half of the expense of certain roads and bridges to be formed in the Highlands, provided that the other moiety were furnished by the counties within the operation of the Act. The two chief natural obstacles that had separated Sutherland from the rest of Scotland were the Firths of Dornoch and Loch Fleet: the first was spanned by Telford's great iron bridge at Bonar; the second by the Mound, and a bridge fitted with strong valve gates by which the tide was excluded; and thus a large area of good land was reclaimed from the sea, at the same time that a road was carried into a district that previously could only be reached by making a wide detour. Within twelve years the most important districts of the county were traversed by roads better than most of those in England. A postal service was next established, and the modern visitor finds that the post-houses then built have been gradually developed into admirably conducted and comfortable inns.

Meanwhile, as each district of the interior was cleared of crofters it was let as a sheep-farm, sometimes to a man who brought with him, from a Border farm, experience in the management of Cheviot sheep on land not dissimilar to that which he adopted as his new home. More frequently, however, the new tenant was one of the native gentlemen who rose superior to the prejudices that naturally prevailed among his own class—a class that for many years had enjoyed the special privileges and dignity of tacksmen. Those whose intelligence and liberality of mind made them ready to assist their landlord in carrying out the great scheme of reformation, gradually replaced those whose selfishness and dulness prevented them from seeing that their own interests were identical with the public good.

The first adventurers in sheep-farming in Sutherland were Messrs. Atkinson and Marshal, residing near the river Aln, in Northumberland. They adopted in the north, with one important difference, the same system that, in common with other Border farmers, they pursued in the south. The sheep were divided into hirsels, or distinct flocks; but, whereas in the south there were but three hirsels—of hoggs, wethers, and ewes, the ewes giving their first lamb at two years old, and the wethers being sent to the feeder at two years and a half old—in Sutherland they divided their sheep into four or five hirsels—of hoggs, wethers, gimmers, and ewes; thus the yearling ewes, instead of being sent to the ewe-flock at once, were sent for

about eighteen months to "yell gimmer-land," and not put to the ram till they were two-and-a-half years old, while the wethers were not sent to the feeder until they were rising four, and were not killed until they were four or five years old. One of the immediate results of converting the land into sheep-walks was, that every plot of land that had been tilled by the crofters became covered with nutritious and luxuriant herbage. These "green lands," or "town lands," usually in sheltered glens and by the side of streams, served for the wintering of the sheep that ranged in summer over the neighbouring hills and moss-land. The herbage on the hill sides was greatly improved by sheep-draining and by the periodical burning of the heath. Mr. Loch, the Duke's commissioner, writing in 1820, states that, although many of the grazings were only partially stocked, the number of sheep in the county at that time was believed to be about 140,000, the annual export of wool 415,000 lbs., and the number of store sheep driven south every year 30,000. In this way a vast district that had been barely self-supporting now contributed considerable supplies to the manufacturing population of the country. While the income of the proprietor was increased, and the sheep-farmers found their occupation highly profitable, the position of the original inhabitants was improved; they no longer suffered from famines, but were able to add to their comforts by the sale of the fish not needed for their own support. In 1830 Mr. Patrick Sellar, the leading sheep-farmer of his day, reported the annual exports as being, at the time he wrote, 180,000 fleeces and 40,000 store sheep. Mr. G. Sutherland Taylor, in his general observations on the county of Sutherland, written in March, 1841, says that the permanent stock of Cheviot sheep maintained in the county was not under 170,000. As this was written in March, it is probably an estimate of the number of sheep shorn each year, and does not include lambs. The Agricultural Returns of Great Britain show that the number of sheep in Sutherland on the 4th of June for the last three years has been—

	1876.	1877.	1878.
Sheep 1 year old and above	172,922	170,907	172,527
„ under 1 year old ..	55,581	48,600	62,059
Total	228,503	219,507	234,586

Although there are apparently rather fewer sheep in the county

now than there were when the farms were first fully stocked, some fifty years ago, it is probable that, in consequence of their earlier maturity, the number of store sheep annually exported is now slightly in excess of the number then sent out. The most important change in the management of the flocks has been that whereas at first all the stock was wintered in the county, it is now the universal practice to send the hoggets to spend their first winter on arable farms, commonly in Ross or Caithness. The natural herbage of the county was found to be much better suited for the adult animals than for lambs. When placed upon the green land, the rankness of the herbage caused them to die of braxy; and the annual loss under ordinary management, from this cause alone, is stated by Mr. Sellar, in 1830, to have been from 15 to 30 per cent. On the other hand, the coarse and innutritious nature of the heath and other Alpine plants upon the hills, caused among them an ailment still well known in Sutherland. It is commonly called pining, but starvation would be an equally appropriate name for it. It was described by Sellar as "a general wasting of the body, and prostration of the strength of the animal, followed, if not cured, by death. The skins brought in were found to consist, in a great degree, of those of the youngest and worst-fed lambs, which fell at every age by pining or drowning, or both, after having gone through the ordeal of the braxy."

It was also observed that, after certain herdings had been for several years depastured by old sheep, lambs might for one year be trusted on them if well herded. At the present time it is usual to send all the wether hoggets, and the weaker portion of the ewe hoggets, to be wintered elsewhere. The strongest ewe hoggets are often kept at home, but no such complaint as braxy is observed among them. This fact is worthy of special notice, proving, as it does conclusively, that the herbage of the green land no longer possesses the rank luxuriance that it had when first it was converted from tillage to sheep land.

The crofters used to keep their cattle and ponies at night in byres on the low-lying lands, which were thus enriched by their dung, as well as by the rude tillage of the soil. That artificial fertility or "condition" of the land has been steadily lowered, having been carried away by sheep, part of it to be spread by their droppings over the mountain sides, and part sent out of the county in the shape of flesh and bone and wool. The hoggets were at first sent by road to their respective winterings; since the formation of the Highland railways they are now more commonly sent by rail. One advantage of this is, that they can be sent farther from home; and the Sutherland men are no longer obliged to accept whatever terms may be offered them in Caith-

ness and Ross. But a still greater advantage is obtained in fetching them home in the spring. If rough weather set in, as it often did, when they were being driven home, the losses of life and of condition were enormous.

The northern continuation of the Highland Railway owes its existence to the present Duke of Sutherland, whose investments in the Northern lines are—

	£
Highland Railway Company (Perth to Bonar Bridge) ..	99,864
Sutherland Railway Company (Bonar Bridge to Golspie)	94,200
Duke of Sutherland Railway (Golspie to Helmsdale) ..	63,000
Sutherland and Caithness Railway (Helmsdale to Wick and Thurso)	60,000
Dingwall and Skye	5,000
	£322,064

The line from Golspie to Helmsdale was constructed solely at the expense of the Duke.

During the seventeen years that the property has been in his possession, a great variety of works have been undertaken for the development of its resources, and for the employment and benefit of its population. In all of them the Duke has not only taken the keenest personal interest, but they have received his constant supervision and attention. It would be foreign to the subject of this report to describe the numerous experiments that have been made for converting peat into articles of commercial value, the development of the sea fisheries, the breeding of salmon, and the building of numerous shooting lodges for the occupation of persons who circulate money in various ways in districts formerly cut off from civilization. Many other works, however, have been undertaken that have materially, though indirectly, contributed to facilitate the work of reclamation. Many of these undertakings are concentrated at the village of Brora. A seam of coal crops out here upon the coast; a shaft was sunk at the beginning of the century, and coal was raised in small quantities for many years. The contractor who was working the mine became insolvent, and work was discontinued about the year 1830. Forty years afterwards, on the completion of the railway, the mine was reopened, and has since been worked by the Duke. A tramway connects the shaft with the railway and the Brora harbour. The quality of the coal is poor, but it is largely used in the district. There is a well-organized brickyard and tilery close to the mine. The quality of the clay is better adapted for bricks than for pipes, as the latter cannot be made of sufficient strength without giving them more than average weight; in spite of this drawback, they have been very largely used for draining. A saw-mill and large steam-carpentery works enable the Duke to have all the timbers,

doors, and windows for new buildings prepared at home. A large engineer's shop is provided with turning and screw-cutting lathes, drilling and planing machines, and all other machinery required for building and repairing steam-engines.

The earliest agricultural improvements undertaken by the Duke were carried out on a comparatively small scale, by draining and trenching by hand at Tongue on the north coast, at Lochinver to the south-west, at Carrol near Loch Brora, and at Balone, not far from the railway station at Lairg. Fifty acres of bog and moorland, between Brora and Uppat, were next reclaimed. At Balone much of the land was broken up by means of a ponderous plough drawn by three or four oxen or horses. At Uppat a part of the land was deep bog, whence peat had been cut for many years, leaving the surface very irregular. These ten acres, after they were drained, proved to be too soft to carry either horses or oxen. Attempts were made to cultivate them by means of a common plough driven by a portable engine; but during the trial a number of mechanical difficulties presented themselves.

Questions in mechanics have always been attractive to the Duke. The land at Uppat was within a short distance of the castle at Dunrobin. His Grace spent many an hour watching the steam-driven plough battling with the various obstacles that soft bog, boulder-stones, and buried roots of fir successively opposed to its progress. There was here a power obviously well fitted for the work of reclamation, but needing to be developed and specially adapted to circumstances differing greatly from those of ordinary farm tillage. The more he watched, the stronger grew his interest in the work. He had been long convinced that the proper development of his vast Highland estate required a very large addition to its cultivated area; but the steps for the attainment of that object had hitherto been of necessity slow, and far less interesting than the construction of the railway that he had recently completed. In 1871 a steam-plough was obtained from Messrs. J. Fowler and Co., consisting of two 14-horse-power engines, and a plough carrying a single huge turn-furrow in place of the four usually employed. By this set of tackle the surface was at length ploughed. A new era in the work of reclamation commenced with the trial of steam-power at Uppat.

Lord Spencer, in the third volume of this Journal, well described the important effects that have resulted, first in West Norfolk, and afterwards throughout a great part of England, from the apparently trifling circumstance that, just one hundred years ago, a young man of princely fortune, devoted to field sports, had thrown upon his hands a farm close to his residence at Holkham. Had not his old tenant, Mr. Brett, in 1778, refused to

take a renewal of his lease at 5*s.* per acre, Mr. Coke, afterwards the Earl of Leicester, might never have applied himself to the detailed management of a farm, nor have devoted the whole energy of his mind to a pursuit that, while it afforded him great personal pleasure, enabled him at the same time to confer a lasting benefit upon his country.

Results not less important to the country may fairly be anticipated from the energy and enthusiasm with which the Duke of Sutherland has personally devoted himself to the development of a property, comprising, according to the Doomsday Book of Scotland, 1,176,343 acres, with a rental of 67,000*l.*, exclusive of the 149,870 acres owned by the Duchess, chiefly in the adjoining county of Ross. After the lamented death of his late commissioner, Mr. George Loch, in 1877, his Grace kept the administration in his own hands for two years. Lieut.-General Sir Arnold Kemball has recently become commissioner; but the Duke continues to take great personal interest in the work of reclamation. A private engine, which he usually drives himself, carries him from the Dunrobin station wherever work is going on near the line of railway; he is constantly on the move, superintending each operation. Some of the machinery used has been designed by himself, and some has been modified at his suggestion. He is one of many striking exceptions in the present day to Bacon's aphorism, that "nobility of birth commonly abateth industry."

No one took a keener interest in the projects of the Duke than the late Mr. Kenneth Murray, of Geanies, who had already gained much experience in the reclamation of land on his own estate.

In March 1870, Mr. Murray submitted a full and elaborate report on proposed improvements in the district of Shinness. This report formed the basis upon which, two years later, operations were carried out upon a greatly extended scale. Although its estimates were exceeded, and many of its details were modified in execution, yet the general truth of its principles and observations have been fully confirmed by the results already obtained.

A granite obelisk crowning the highest eminence on the reclaimed land at Shinness records the loss sustained by the untimely death of Mr. Murray, when the scheme that he originated, and superintended with the deepest interest and assiduity, was but half accomplished. Had he been spared to animate and direct the full execution of the plans that he had drawn up with such ability and foresight, the result would, in all probability, have been far better than it is.

Mr. Murray's report begins by stating that a very large area in the neighbourhood of Lairg, lying westward along the banks of Loch Shin, and northward on the banks of the river Tirree,

is capable of being made greatly more productive either as arable land or by surface improvement, and that the measure is recommended by many considerations of public policy as well as of private interest. Briefly replying to three objections that have been raised, he states that the *climate*, though late and cold, is not so late or so cold as that of many districts in profitable cultivation in the north of Scotland ; that on the farthest west margin to which he proposed to extend the improvement he had seen grown excellent crops of oats, barley, turnips, and potatoes, while there were traces of corn cultivation in old times from 110 to 150 feet higher than the existing fields of Shinness. Admitting that the district is especially liable to *mildew*, causing loss to grain and green crops, he points out that this had been due to mists arising from large "floes," or green mosses full of stagnant water, and would be wholly removed by thorough drainage. In reply to the third objection, "that the locality is so exposed that the wind would do injury," he remarks that during spring, summer, and autumn the injury from wind would be less here than on the eastern coasts; and although it is undoubtedly a wild place for snow-drift in winter, that might be altered by planting for shelter, and by erecting stone and turf fences. The inland position of the district had formerly made the cost and difficulty of communication a very serious objection; but since the railway had been carried to Lairg this objection had been removed. He recommended the operation because the demand for arable land was increasing; the character of the soil is adapted for oats and green crops, the crops most wanted in Sutherland. "For oats, principally in meal, and turnips, it is not unreasonable to say that at least 25,000*l.* go off the estate to Caithness and Ross; and, though oats and oatmeal are not increasing in cost, the value of turnips has risen so much that it must affect, I am certain, the progressive value of hill pastures in the north. And more than that has happened. Before the recent extensive reclamation of land in the older arable districts of Ross and Inverness, the hill sheep used to have out-runs of heath or other coarse pasture, to which the turnip was an adjunct merely ; and they not only wintered more cheaply, but the wintering was better for them. Now, penned up on the turnip-field, occasionally getting out only on to short artificial grass, they lose a great deal of their hardiness, and the result is that a great many have to be sent back again for a second wintering or they would die. This is a very serious matter—is becoming more so every year; and in view of these facts a large reclamation of land in the centre of Sutherland has additional interest.

"As all land improvement must proceed gradually, and im-

provement invariably leads to further improvement, I propose to deal mainly at present with the shores of Loch Shin and the immediate banks of the Tirree. I entertain no doubt that, for every acre which may be cultivated within the first twenty-one years, half as many more will be reclaimed in the succeeding lease, and probably at a less expense than those which are made arable now. Experience teaches that over-exertion in the matter of improvement of land is a mistake, and that, in fact, it often annuls for a time the real benefit of what was otherwise a true measure of improvement. Still, from the character of this subject, and the necessity of improving the climate, I hold that this particular operation must be extensive to be successful."

In carrying out the work the estimate of cost given in Mr. Murray's report was very much exceeded, from various causes, many of which could not have been foreseen at the time it was written. Although this is the case, it may be interesting to give his estimate, with some of the remarks he appended to them. In drawing them up he was guided by his own previous experience in the reclamation of not less than 2500 acres of waste land, chiefly in the county of Ross.

The thorough drainage of the land, to be done chiefly by pipes, he estimated would cost 5*l.* per acre. Trenching the land by hand he puts at 10*l.*; but reckoning that four-fifths of the land could be ploughed by horses or oxen to a depth of 12 inches at a cost of 2*l.* 10*s.*, he sets the average cost of breaking up the whole surface at 3*l.* per acre. The cost of blasting boulders and removing stones from the surface he puts down at 2*l.*; buildings at 5*l.* 10*s.*; fencing at 2*l.*; and roads and bridges at 10*s.*; making thus a total of 18*l.* per acre, exclusive of planting for shelter, as the estimated cost of preparing the land for its first crop. With regard to the rate of interest to be expected on the outlay, he says that "no land improvement can possibly pay a high rate at first. A separate operation, like drainage, often pays immensely, but when the improvement is dead-weighted with the cost of buildings, roads and fences, &c., it takes time and maturity to bring back anything higher than the most moderate interest. Then it is to be borne in mind that that most moderate interest is liable to assessment; for the moment you create property it is rated, and even on new subjects these rates will take about a seventh of the income. . . . You can rarely *create* land to pay more than the same rate at which land already made can be purchased, and that is at best $3\frac{1}{4}$ per cent. The profit is at the end of the first lease, except in rare cases."

The experience gained at Uppat led the Duke to resolve on ploughing or trenching the whole of the land by steam-power to a much greater depth than the 12 inches named by Mr.

Murray. Several English contractors visited Sutherland, and were invited to tender to do the work by contract. The superficial inspection of the proposed site was not in itself discouraging; but when they went to Uppat, and saw the difficulties that had been met with there, their courage failed, and no satisfactory offer could be obtained. The Duke was therefore obliged to take the work in hand himself. Implements specially adapted to the work have been invented and purchased, together with necessary steam-power, as they have been required, from Messrs. J. Fowler and Co., of Leeds; and it may be mentioned to the credit of this firm that, in addition to other facilities which they have always been ready to afford, they have borne no inconsiderable share of the heavy expenses that have been incurred in a great number of experiments made to discover the best form and construction for each of the appliances used.

Shinness Reclamations.

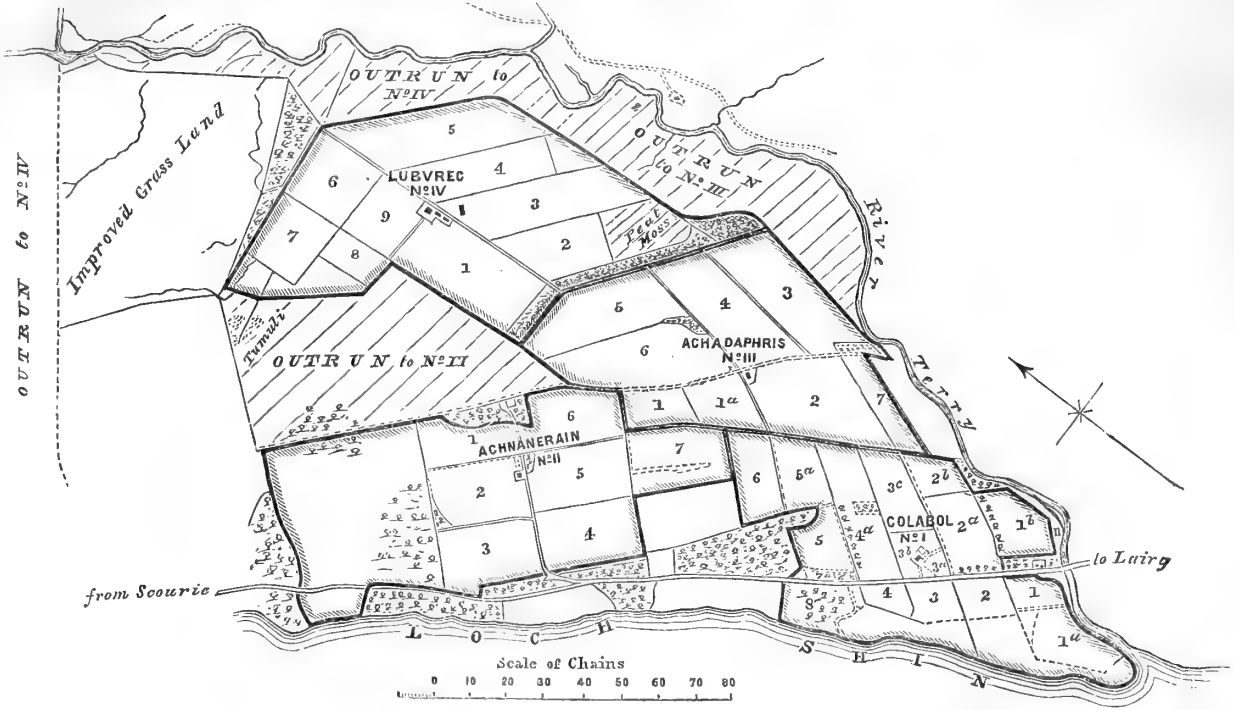
A traveller, passing in 1872 along the high road from Lairg to Tongue, and emerging from the coppice of stunted birch that skirts the north-eastern extremity of Loch Shin, as his road turned northwards three miles from Lairg, would have seen upon his left hand a broad undulating basin of moor and bog, rising gradually from the shore of the Loch to a low ridge of hill, chiefly conspicuous from two small belts of wood of stunted mountain-ash and birch upon it, then extending northwards to the foot of the hills in a broad valley traversed by the river Terry; a scene of beauty and yet of desolation, with no human habitation on it, and showing no signs of cultivation except a few small spots upon some of the mounds hardly distinguishable by the eye, and chosen because they needed little or no drainage. If he had returned five years later he would have found the whole area between the Loch and river completely transformed, and the space occupied by four large and well-cultivated farms, each with a well-built and ample steading, surrounded by large and rectangular fields, well fenced, and covered with luxuriant crops of oats, turnips, and grass. He might notice that good roads gave access to each field, and that here and there, amid grazing sheep and cattle and the ordinary features of farm-tillage, smoke was rising from engines employed for traction on the roads or in cultivating the land. Scattered over the plain he would see numerous labourers' cottages, a smithy, workshops, a school-church, and a post-office—a scene of fruitfulness and rural activity instead of a dark lifeless expanse of moorland. The steps by which this transformation was effected it will now be my business to trace.

The farms have been numbered in the order in which they were reclaimed; their relative position is shown on the plan (Fig. 1). Colabol, No. I., is bounded on the east by the mouth of the little river Terry, and on the south by Loch Shin. Achnanerain is No. II.; it lies to the west of No. I., and it also runs along the shore of the lake, being only separated from it by fir-plantations that occupy the strip of boggy land that forms its immediate margin. Achadaphris, No. III., lies to the north of No. I.: and further north still is situated Lubvrec, or No. IV., bounded along the whole extent of its north-eastern side by the upper course of the Terry.

Operations were commenced by cutting a long, deep ditch in the summer of 1872 on the north-east of No. I., running through the small bog and carrying its surplus water into the Terry. Belts of Scotch fir were planted for protection, and a road of hand-laid stones was carried from the highway to the site of the steading, at a cost of 2*s.* 6*d.* per lineal yard. The steam-plough commenced work on Colabol in the summer of 1873; on this farm it encountered few rocks or boulder-stones, but a great number of roots of fir-trees; these were dragged out by the engines, but when the roots were large it was necessary to loosen them partially by hand-labour—a tedious operation, for occasionally over an extra large root as many as six men were employed all day in getting it sufficiently disencumbered for the engine to pull it out. At the present time such work is done much more economically by the use of dynamite; one or two charges are placed in the bog under the root, and at a cost of 6*d.* the soft peat is sent flying in all directions, and the root is sufficiently loosened for removal by steam. On this and others of the Shinness farms the steam-ploughing was continued through the winter, whenever the weather permitted. In this respect, also, wisdom has been learned by experience, and it is now considered far better to let the engines stand idle and turn the labourers to other work than to employ them at a season when the work is not only done under difficulties, but often with a bad result. The work done by steam in winter has proved both expensive and unsatisfactory. The hole left where a root has been pulled out of *wet* peat is more troublesome in after-cultivation, for a while at any rate, than the root itself would be.

The draining of this farm was done after the ploughing; the main drains are chiefly constructed of stones, and empty themselves into wide ditches, cut at a cost of 4½*d.* to 6*d.* per cubic yard, that carry the water into the river or the Loch. The minor drains are mostly 2½-inch pipes 4 feet deep; these cost 3*s.* 6*d.* to 4*s.* 6*d.* per chain for digging and filling in on deep peat, where the roots made the work difficult. In firmer soil

Fig. 1.—*Map showing the Reclamations at Shinness.*



many stone-drains were put in, at a cost of 7*s.* to 8*s.* per chain for cutting and filling. The stones were laid alongside the drain ready for use, a square open channel was built with four large flat stones in the bottom of the drain, and the smaller stones were then loosely filled in on the top.

The existence of a field of limestone on the shore of Loch Shin within two miles of the works has been of the utmost value in the reclamations. Four kilns have been kept constantly at work; but in addition to this it has been occasionally necessary to obtain a further supply from other kilns in the far north, belonging to the Duke, at Erribol, near Tongue. This lime is brought by sea from Erribol to Helmsdale, and thence carried by rail to Lairg. The quantity applied is usually 60 bushels per acre.

The Shinness limestone was analysed in 1871 by Professor Anderson. He found it of somewhat inferior quality, containing carbonate of lime, 64·35; carbonate of magnesia, 12·19; and silica, 20·11 per cent. The economy of carriage made it better to employ the weaker lime in large quantities rather than fetch by sea from England better lime to be used more sparingly. The burnt lime obtained from Erribol contains—

Lime	70·53
Magnesia	22·48
Iron and allumina	3·
Silica	1·50
Carbonic acid	2·39
	99·90

In February 1874 the fields marked No. 1*b*, No. 2, and No. 2*a* (Fig. 1, p. 411) were harrowed down, limed, and dressed with 4 cwt. of superphosphate and 1 cwt. of kainite; a part of the land also received a later dressing of nitrate of soda; oats were sown in the end of April and beginning of May. The rest of this farm was brought under crop in 1875.

Colabol Farm.—The following notes are the result of careful inspections of each field of this farm, made in July 1877, September 1878, and August 1879:—

No. 1 (15 a. 0 r. 1 p.). This field has a good free yellow subsoil, and is one of the best fields upon the farm; it was cropped in 1875 with oats; in 1876, hay; aftermath stocked by cattle; sheep were brought on to it from the hills in February 1876. In July 1877 there was a good plant of grass; it was close fed without intermission till it was broken up by the "discer"* in February 1878 with excellent effect; it was then harrowed, ridged,

* This is an implement specially constructed for these works of reclamation; a description and figure of it will be found on p. 429.

dunged, and drilled in May with turnips, yielding a very good crop. These were eaten off by hoggets, getting a little hay and a run out on the hill. In the spring of 1879 the field was grubbed by oxen and sown with 6 bushels per acre of Swiss oats, without any artificial manure, but seeded down with clover and rye-grass. In August 1879 the oats looked well, a good even crop. Two small plots were sown as an experiment, one of them with seed that had been grown one year, and the other with seed that had been grown two years upon the farm. There was no very marked difference to the eye between these plots in August. Last year the crop from home-grown seed was one-third more than that grown from similar seed bought elsewhere.

No. 1*a* (20 a. 3 r. 32 p.). A field of deep peat, imperfectly drained; it was treated up to February 1878 in all respects like the previous field, but it has since been broken up; it is much overrun with sorrel and moss. In one part many rough pieces of dry fibrous peat remained on the surface in 1877; the result of running ordinary heavy harrows over the land after it was ploughed in 1874, and then leaving it exposed to the sun and wind till the loose pieces acquired the toughness and elasticity of dry sponges. This would not have occurred if the "discer," a subsequent invention, had been employed. A few drains were relaid in 1878.

No. 1 *b* (26 a. 3 r.). In 1874, oats; 1875, grass cut for hay, a good crop; 1876, grass fed off and ploughed up in winter by horses; 1877, oats; at the north end a very promising crop, but uneven at the south end, the drains being here defective. This crop (together with all the corn crops on the new farms, and a very great proportion of the crops grown on long-established farms in the north of Scotland) was lost in a hurricane of extraordinary violence on the night of the 22nd of November, the harvest having been delayed by a heavy snowstorm early in October; particulars of this disastrous harvest will be given further on, when treating of No. IV. farm (Lubvrec). The drains were relaid over a third of this field in 1877, when the main outfall pipe was found to have been broken by an engine passing over it.

Wherever steam-cultivation is adopted, it is very important that the drains be laid on solid land below the peat.

Owing to divided responsibility in carrying out the work, many of the drains were laid at the ordinary regulation depth of 4 feet, in places where the thickness of peat required that they should be carried an extra depth in order to rest on solid ground. In autumn 1877, the land was "disced" by steam; in April and May 1878, it was dunged and ploughed by horses and oxen, and drilled with swedes, Aberdeen yellows,

and a few potatoes—a very good crop all over the field. The Aberdeen turnips occupied the south side of the field; they were fed off by sheep and the land was grubbed by oxen. The swedes were all carted, and the land was then ploughed. The whole field was sown with 6 bushels of potato oats, without artificial manure. A good crop was standing all over the field in August 1879, best after the turnips and weakest after the potatoes.

No. 2 (20 a. 3 r. 9 p.) and No. 2*a* (28 a. 1 r. 3 p.). In 1874, oats; 1875, swedes; 1876, oats, estimated at 6½ quarters per acre—the oats went down in places and killed the grass; in 1877, grass, hard fed. In No. 2*a*, the sheep were turned in at the end of May and the field was laid up for hay without a top-dressing; the plant was good, but the crop light, in consequence of its hard treatment. Both fields were fed constantly during 1878, clover and rye-grass both standing well.

In May 1879 both of these fields were rolled by the small traction engine; this operation has greatly benefited the softer parts of the land, and the fields are covered with excellent grass and clover. The four fields, 1, 1 *b*, 2, and 2 *a*, rest upon an excellent subsoil and will well repay cultivation. An open ditch, dividing the fields, receives most of the drains. In August 1879 the ditch greatly needed cleaning out and deepening; sheep had trodden down the sides, and the water in it stood level with the mouth of the drains.

No 2*b* (10 a. 1 r. 25 p.). In 1875, oats; in 1876, turnips, part dunged, sown late—a fair crop, carted off; 1877, Sandy oats, not top-dressed—a good crop; 1878, all the drains in this field were re-opened in spring. The cost of labour, both for stone and for pipe-drains, being about the same as for making new drains. In 1879 grass-seeds, a poor crop, with much *bromus mollis* in it. This field has a rocky subsoil, and presents every appearance of having been imperfectly limed.

No. 3 (21 a. 3r. 27 p.) and No. 3*a* (3 a. 0r. 22 p.). In 1875, oats; 1876, hay, a poor crop; 1877 and 1878, very poor grass, with much sorrel and fog-grass, constantly fed. Last winter swedes were carted on to this field and ewes were fed upon them, with ¼ lb. of oats and ¼ lb. cake per diem while the snow lasted. The grass was also rolled by steam. A great improvement has resulted from this treatment, and clover is much more abundant than it was previously.

No. 3*b* (10 a. 2 r. 24 p.). In 1873, wheat, strong in the straw, but the grain did not ripen well; 1874, turnips, a good crop; 1875, oats, a fair crop; 1876, hay, a fair crop, well harvested; 1877, grass, fed closely down; 1878, still closely grazed, the whole surface is well covered with small native clovers, yielding excel-

lent feed. This is the best field on the farm, probably worth 2*l.* to 2*l.* 5*s.* per acre to rent in its present state. In spring, 1879, ploughed by horses and oxen, then "disced" by steam, harrowed, grubbed, and again harrowed by oxen, ridged, and heavily dunged; after the ridges were closed it was drilled about 22nd May with swedes, sown with 2½ cwt. superphosphate, 2½ cwt. ground bones, and 1 cwt. phospho-guano. In August the swedes were very good and growing vigorously, in spite of the roughness of the ground, the old turf not yet having rotted completely; 1 acre of vetches, good.

No. 3*c* (31 a. 2 r.). In 1876, oats, a fair crop; 1877 and 1878, grass rather poor. In 1879, 9 acres turnips, 1 acre potatoes, 21 acres oats. The turnips are on the south side; the cultivation and treatment were the same as those for swedes in the last field. They were drilled at the beginning of June, destroyed by grub, and resown by hand. The potatoes promised well. The land for oats was ploughed in autumn by horses and oxen, harrowed in spring, and sown broadcast with 2 cwt. of superphosphate, 1 cwt. bone-meal, and 1 cwt. phospho-guano. South side Swiss, and north side Sandy oats. A fair crop over the field. The Swiss oats were last sown, but first ripe.

No. 4 (11 a. 3 r. 37 p.). In 1875, oats; 1876, turnips—east side fed off by sheep, west side carted off; 1877, six acres in oats—good; two in vetches, two in mangolds—both poor; two in potatoes—good; 1878, six acres grass, after oats, and six acres in oats. A further illustration was seen here of the care that should be taken to prevent fibrous peat becoming dried before it is broken up. A man and cart were employed in removing sponge-like pieces of tough fibrous peat, from 6 to 12 inches square, that had been allowed to get dry in 1874, and still showed no signs of coming to pieces. The oats were a poor crop, and the seeds sown with them failed in 1879. The second year's seeds on the east side are much better, with fair clover in them.

No. 4*a* (51 a. 3 r. 16 p.). In 1875, oats at the south end; 1876, oats at the north end, turnips at the south end; 1877, all in oats, a good crop after the turnips, and a fair crop obtained by the application of 4 cwt. dissolved bones on the oats grown after oats; 1878, after being late fed, a crop of 12 cwt. of hay was obtained from the south end; the whole of the field showed an excellent plant of clover and grass in the autumn of 1878. Since then the grass has been steam-rolled and fed by sheep and cattle; it continues to improve.

No. 5 (27 a. 3 r. 17 p.) and No. 5*a* (30 a. 0r. 32 p.). 1875, oats; 1876, oats, top-dressed with nitrate and superphosphate—a fair crop of heavy oats, weighing 41 lbs. per bushel;

1877, turnips ridged with dung and artificial manure—a fair crop, eaten by sheep; 1878, Sandy and Swiss oats, sown broadcast after the sheep, and merely harrowed in by horses and oxen. A heavy crop of the Sandy oats; the Swiss oats, a much lighter crop, ripened a fortnight sooner. Although, in a later season, the early maturity of the Swiss oats is a great recommendation, it will not be sufficient, taking the average of seasons, to make up for the great deficiency in the weight of grain and straw. It may be well, however, to grow a field or two of this variety on each farm in the far north, so as to commence harvest-work before the main crop is ripe. As soon as the stubble was cleared, hoggets were turned out on the young seeds. After the snow had gone, the land was steam-rolled, it has since been fed by sheep and light cattle. The grass is now good, although a little injured by the treading of the cattle.

No. 6 (32 a. 1 r. 34 p.). In 1876, oats, very poor; 1877, oats, top-dressed with 2 cwt. dissolved bones and 2 cwt. superphosphate—a fair crop; 1878, grass, grazed by sheep and cattle —a fairly good plant. In 1879 this grass had much improved, and the clover was beginning to cover the ground. In the previous winter sheep were fed here with cake and straw. A feeding experiment was conducted last winter in this field on 10 wether hoggs, 10 ewe hoggs, and 20 dinmonts (i. e. young wethers of 18 months old); during the long period that the ground was covered with snow each of these sheep received 15 oz. of cake per diem with straw, the total cost per head being 8*s*. 6*d*.; as soon as the snow was gone they were all sent to the hills. Many persons expected that the hand-feeding would unfit them for roughing it, but, instead of this, they proved at clipping-time to be the best sheep on the farm. This experiment is very encouraging, showing that by the judicious use of decorticated cotton or other cakes the sheep and the land may be alike benefited.

During the progress of the reclamations the men were housed in wooden and iron bothies. Five of the wooden buildings remain as labourers' cottages, and there are also four stone-built cottages on the farm. The farm-buildings are built of stone taken from the land, and are roofed with Welsh slates. They contain stabling for 10 horses, stalls for 24 head of cattle, two yards with covered sheds, a root-house, cart-shed, and barn. The fields are divided by wire fences with birch-wood posts. A beech-wood fence has been planted on each side of the high road running through the farm. The tenant has erected on this farm a very convenient set of yards and shedding for dipping, marking, and dividing sheep.

The reclamation of Colabol extended over a period of three

years ending in the spring of 1876, when it was let, together with the No. II. farm, Achnanerain, to the Master of Blantyre, a nephew of the Duke of Sutherland, to be worked in connection with the large sheep-farm which he held previously at Sciberscross. The chief part of the land is rented at 1*l.* per acre for nineteen years; but three fields on each farm were found to be imperfectly reclaimed, and these are taken for five years at a grazing rent of 7*s.* 6*d.* per acre, viz.: Nos. 1*b*, 3, and 6 on Colabol, and Nos. 4, 5, and 7 on Achnanerain.

The treatment of the land has been much influenced by considerations for the welfare of the sheep. During the hard winter of 1876–7 the sheep were kept on the young seeds, and no field was allowed a sufficient rest to give the hay-crop a fair chance. The vigour and vitality of the grass and clover, in spite of this, are very striking, indicating that the soil and climate are well suited to their growth. No hay was made on either farm in 1879 from the young seeds; it was thought best to let the clover-seed fall and fill up the ground. The second year's grass was not cut for hay, because in 1878 the home-grown hay was found to be very inferior to hay purchased in Ross-shire.

Achnanerain.—On farm No. II. the steam-plough commenced work in the autumn of 1873. The old name of this spot—Achnanerain, or the field of corn—was no doubt given to it from the small patches that had been once under cultivation, and that still bore a greensward of turf. In spite, however, of its inviting name, it proved to be a very difficult and expensive subject for reclamation, having just below its surface a far greater number of boulder-stones and rocks than was anticipated. It was in the breaking-up of this land that the Sutherland plough was most severely taxed; and as some of its most important improvements were here tried and adopted, it will be convenient to give a description of this invention before further details of its work are given.

The first step in adapting the steam-plough to work in a peat bog was the substitution of a single monster turn-furrow for the four or five usually carried. To prevent the implement burying itself in soft ground, the frame was next supported on very broad wheels or rollers. It was then found to work fairly where there were no obstructions, but whenever the share struck against a landfast rock or root it was liable to receive some serious injury. To meet this, the revolving coulter was invented by Mr. Wright, the Duke's secretary. It consists of a vertical disc of steel placed in front of the sock, and cutting the soil, as it revolves, to a depth of about two inches below the point of the sock. When this revolving coulter meets with a landfast stone, or with a root too large for it to cut through, it revolves over it,

thus lifting the plough clearly over the obstruction. The cutting disc has proved to be better adapted for cutting through the tough mat of grass and heath-roots often found on the surface than any fixed coulter of the ordinary form.

The next improvement was suggested by the Duke. It consists of a huge iron hook, like the fluke of an anchor, trailing behind the plough, and pivoted on to the back of the iron frame-work of the implement. This contrivance, commonly called "the Duke's toothpick," acts as a subsoiler, stirring the soil to a depth, varying with its hardness, of from 8 to 18 inches. Every obstruction that the revolving coulter has been unable to cut through or to force aside is next attacked at a lower depth by the toothpick. In most cases the root or stone is at once turned over and brought to the surface; but as this cannot always be done, the hook is made of sufficient strength to withstand the full power of the engine. There is a dead pull for a minute, then the engines are reversed, the implement is backed, and a second attack is made. If this also fails, the toothpick is lifted over the obstacle, and a stake is driven in, to mark the spot till the offender can be blown up by dynamite. At first the stirrer was made to terminate in a steel point; in 1877 a small short turn-furrow was attached; and this was replaced in 1878 by a turn-furrow of an ordinary shape but of extraordinary size.

Fig. 2.—*Elevation of Sutherland Plough.*

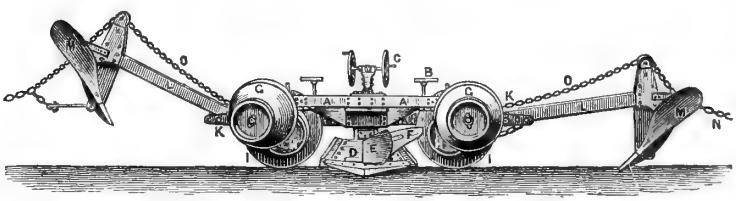


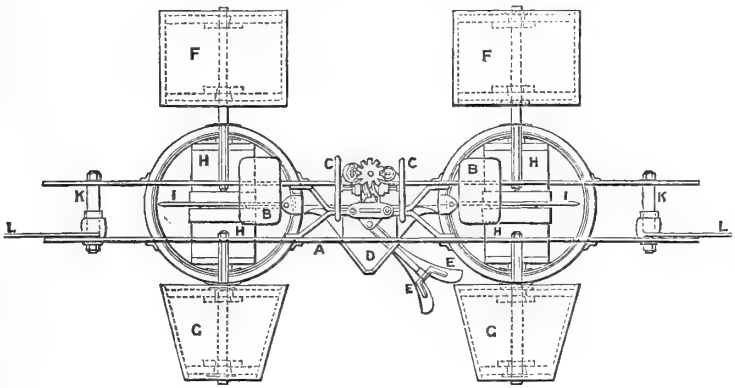
Figure 2 is from a photograph showing the whole of the implement, standing upon a hard surface, but with its parts arranged for travelling towards the left.

Figure 3 gives a plan upon a larger scale, leaving out the stirrers or subsoilers.

A A is an iron frame, about 10 feet long and 18 inches wide, carried upon six rollers. The ploughman sits upon the seat B, facing his work, and steers by means of the handle at C. The head of the plough, D, is hung from the centre of the frame and is double-ended, having a lateral cutting-share of a triangular form, so as to cut either way. To the centre of this head the mould-board E is hinged; it is self-acting and turns either way to suit the direction of the plough. Of the six rollers, two (F F,

Fig. 3) are for the land-side, two, G G, press on the top of the furrow, while the two, H H, in the centre, in connection with the revolving coulters, form the steerage. The revolving coulters, I I, are seen in Fig. 2, projecting beyond the middle rollers, which they bisect. They are flat iron discs, about 3 feet in diameter, rotating upon the same axes as these rollers, but can be made more or less eccentric with regard to them, so that they may be set to penetrate from 4 to 15 inches deep. The two landside rollers give balance to the implement, and assist in carrying it through gullies or other inequalities of the surface. The two furrow-

Fig. 3.—*Plan of Sutherland Plough.*



wheels assist in completing the turning of the furrow after it leaves the mould-board, and press it into its position; they also assist in balancing and guiding the implement. At each end of the frame, which is a strongly trussed structure of malleable iron, the lateral pieces are united together by a transverse iron bar, K, which passes through, and serves as a pivot for the end of the shaft, L, of the trailing subsoil plough, M. This second plough is kept down to its work by the tension of the tail rope, N, acting on the loop line of wire-rope, O, which passes over the plough and connects the tail and the pulling ropes. It will be seen that the pull for drawing the implement is taken through the plough beam; and when it is required to be reversed, the engine pulls the one plough out of work, while it presses the other by means of the looped line into its place for working. The effect of having the plough hung on the centre, K, and kept in its work by means of the pressure of the tail rope, is to give an elasticity to the working of the implement, and to allow it to override obstructions that cannot be pulled out.

Engines of 14 and of 16-horse-power have been employed for

drawing the plough, all of them specially constructed for the purpose, and worked at more than double their nominal power. They are provided with two ploughing speeds ; by means of a second shaft the winding-drum is driven at a slow speed for reclamation work, while for ordinary farm work or for travelling on the roads it can be driven at full speed by the direct shaft. Where there are very many large roots or stones to be pulled out, the 16-horse engines are best, but their greater weight is a serious disadvantage on soft ground ; and the balance of advantage, taking one sort of work with another, is now thought to rest with the 14-horse engines. A light wooden roof over each engine gives shelter to the driver, and protects the working parts from the weather.

For travelling on soft land the wheels of the engines require to be of great size ; those of the 14-horse engines are now made of 5 feet in diameter, with a permanent tire of 20 inches, while extra widening rings of 2 feet wide are bolted on to them, giving a surface-bearing to each wheel of 3 feet 8 inches. Notwithstanding these precautions, however, the sinking of an engine in the bog is one of the most frequent causes of delay. When this happens, sticks of birch or other wood are thrown in front of the wheels ; and if these can be supplied in sufficient quantity, the engine will generally be able to pull itself out ; at other times a second engine is required to haul it out. Delays arising from the work of the plough itself are now usually trifling. When the land is full of large stones, as it was at Achnanerain, it rolls and pitches over the hidden obstacles in its way, and the driver has a very uneasy seat ; but the implement is never overturned, and the steadiness with which it tears its way through inequalities of surface over sharp ridges and abrupt hollows is marvellous. No. 3 field at Achnanerain proved to be more like a quarry or a buried antediluvian pavement than an ordinary field for ploughing ; 150 tons of stones per acre were removed from it after it was ploughed. At this time no turn-furrow had been attached to the Duke's toothpick, and most of the stones, though loosened, were not brought to the surface ; from 20 to 30 men were employed in digging them out and placing them in rows ready for removal. Where the ground is sufficiently dry to carry horses, the stones may be loaded into carts, and drawn at once wherever they are wanted for the construction of dykes, roads, drains, or farm-buildings. Wherever the land is too soft for carts, the stones are drawn on sledges to the headlands of the fields by steam-power. Figs. 4 and 5 show the side elevation and plan of one of these stone-sledges ; they are constructed of iron to carry 5 tons, and are drawn, like the plough, by wire-ropes. As soon as a sledge is loaded it is drawn by one of the

engines to the headland; it is there tilted over and emptied by the action of the other engine which, in coiling up its rope, raises the shaft A until it catches the top of the frame at B, and so inverts the sledge. In addition to its convenience for transporting stones on soft and boggy land, the action of the sledge upon the surface of the recently broken land is often very beneficial in summer. While it is desirable that the furrow of peat or moss should be partially dried before it is broken up, it will

Fig. 4.—*Elevation of Sledge for Stones.*

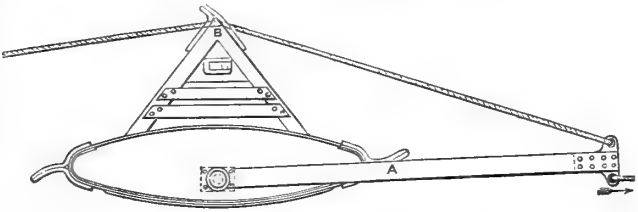
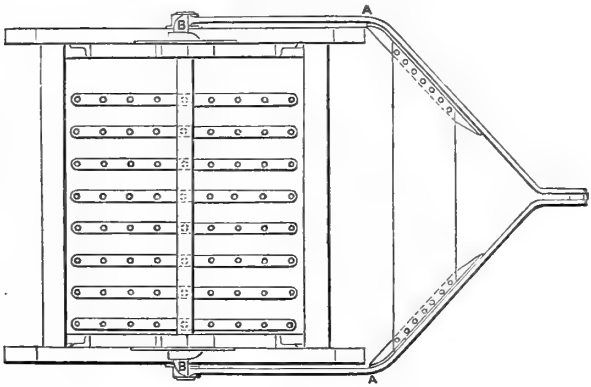


Fig. 5.—*Plan of Sledge for Stones.*



not do to let the drying be continued long enough to produce a dry turf fit for burning; for if once thoroughly dried, it will resist the action of the atmosphere and remain hard peat for several seasons. The sledge not only consolidates the rough surface, but by its rubbing action greatly assists in disintegrating it. The sledges are usually worked in pairs, one returning empty as the other goes down full; they are not provided with any means of steering them, and some difficulty is experienced in getting them to pass each other. When working all day without interruption, as much as 200 tons of stones may be cleared in the day by one pair of engines and a pair of sledges, where the stones are numerous.

Achnanerain is laid out in seven arable fields. The field No. 1 (39 a. 0 r. 3 p.) was left in its rough state longer than any other part of the farm; a part must at one time have had upon it several small cultivated crofts, which were covered with short sweet grass. A belt of small birch-trees extended over one-fourth of the field. These were cut for making good the soft spots in the foundation of roads to carry the engines. In December 1876 the roots of these trees were pulled up by two 16-horse engines. In 1877 these roots and the numerous surface-stones were removed by a contractor in carts for 50*s.* per acre. A ridge of solid rock running across the field made it difficult to drain, but the same contractor drained the whole field with stones at a cost of 9*s.* per chain, having to blast many stones that came in the line of the drains and were too large for removal by the pick. The land was limed, and in April 1878 it was "disced," and then sown with oats and grass-seeds. The summer was unusually dry. Where the land had been "disced" at the beginning of the month the crop was good, but where it had been "disced" late it failed from drought. The "discer" did not destroy the old natural grass as the plough would have done. In August 1879 a great part of the field looked like old pasture, the natural grasses having completely mastered the artificial.

No. 2 (41 a. 2 r. 19 p.) in 1875, oats; 1876, turnips; 1877, oats, a very good even crop; 1878, grass-fed by sheep till the end of May, then laid up for hay; the season was dry, and the produce 10 cwt. per acre of good quality. In 1879 the field was steam-rolled and fed off by sheep and cattle; the clover was very good.

All the high-lying part of this field was covered with birch-wood; it was cleared in a novel manner by steam-power. Short iron chains were passed round the trunks of five or six of the trees; these were then connected with the wire-rope, and a pull from one of the engines uprooted them all together. The work was quickly done; and though it can hardly be recommended as an economical method of clearing a plantation, it afforded a very striking and picturesque illustration of the power of steam.

No. 3 (48 a. 1 r. 25 p.). In 1875, oats; 1876 and 1877, grass grazed; in 1878, drained, "disced," and sown with turnips, and about 12 acres of swedes and 5 acres of rape. The turnips and swedes were a good crop. The rape was much choked by grass, but the plants that survived grew strongly. The swedes were all carted off, and the land was ploughed by horses and oxen. The rape and turnips were fed off by hoggets, getting a run on the hills. When the turnips were covered by snow the sheep got oat-sheaves and hay, with very few turnips; they did well on this. The land was not cleared till late; it was then, to save

time, grubbed instead of ploughed by oxen: 24 acres of the turnip-land were sown with 6 bushels per acre of Swiss oats, the rest of the field was sown with 6 bushels of Sandy oats. Where the rape had been, the oats were top-dressed with 2 cwt. super-phosphate, 1 cwt. bone-meal, and 1 cwt. phospho-guano per acre. There was a good crop of oats over the greater part of the field, although it was much laid after the turnips. Where the rape had been grown the oats suffered much from defects in the drains. It was on account of these defects that the field was let at 7*s.* 6*d.* per acre. This field has already been referred to as more like a quarry than an ordinary field for ploughing. Although when land is full of big stones the expense of breaking it up is very great, it is generally on such land that the best crops are obtained. Many of the boulders are of granite and other rocks containing felspar. These, as they slowly crumble down, yield a soil that contains far more of the elements of fertility than those that are derived solely from the decomposition of the native gneiss, without any admixture of transported boulders. This is very clearly seen on this No. II. farm. Boulders abound in fields Nos. 1, 2, 3, and 6; while fields Nos. 4, 5, and 7, are mostly free from them. By far the best results of reclamation are to be seen in fields Nos. 2, 3, and 6. No. 3, the most stony field on the farm, has proved to be the most valuable. The young seeds were grazed in the winter of 1875, and throughout the whole of 1876 and the first nine months of 1877 by a heavy stock of sheep and cattle. In 1877 Mr. Watt, the grieve, declared that the field had been the sheet-anchor of the farm throughout the previous hard winter. They had had 40 Highland cattle upon it, and frequently from 4 to 8 sheep per acre in addition; yet, in spite of this cruel treatment, the surface was covered in July with a thick mat of clover, still being fed by the sheep.

No. 4 (44 a. 3 r. 5 p.), in 1876, oats. The south-east end of this field is deep peat, with large roots of fir in it, occurring, as they often do, in two or three layers, one below the other. After the field was partly drained, the roots were got out in the winter, and in this way many of the drains were displaced, and treacherous pools were formed. The drains have since been dug afresh, but it is very difficult to make good work under such circumstances. The draining has been satisfactory wherever the pipes were laid in the solid bottom at first. In 1877 turnips and swedes were sown—a very poor crop, partly eaten and partly drawn; 1878, rape and grass-seeds were sown on 1st of May. Sheep were put into the field as soon as the rape was 6 inches high. It might have been better to have sown rape only, and have left it longer before feeding it. In the spring of 1879 a great part of the land was found to be too soft to

carry the steam-roller. The grass is poor; it is being grazed by sheep and cattle, but the latter have poached the surface.

No. 5 (45 a. 2 r. 33 p.), in 1876, oats. Most of this field is deep peat, except on the side next to No. 6, where the soil is strong and good. At the northern corner, the earth dug out for the foundation of the steading was spread over the peat; the oats there were good, but were bad on the deep peat; 1877, oats were again sown. This second crop of oats was very superior to the first. A fair crop was grown all over the field, except on an eminence of fibrous peat; 1878 and 1879, grass; a fair plant, fed by sheep and cattle without roots or other help. The field has not been rolled this year; and the grass is deteriorating in consequence of defects in the drainage. There is much fog-grass in it.

No. 6 (51 a. 0 r. 1 p.), in 1876, 5 acres in wheat and 46 in oats. The wheat promised well, but did not come to maturity, yielding little over 5 sacks per acre; the oats were a good crop. The whole field was seeded among the corn with $1\frac{1}{4}$ bushel of mixed perennial and Italian rye-grass, and 14 lbs. of mixed red and white clover. Sheep were put on to the stubble, and the seeds were fed off at intervals till the middle of May; a light crop of hay was got in 1877. The grass was grazed throughout 1878; a good plant. About 20 acres on the north side were ploughed in autumn by horses and oxen; "disced" in spring 1879, harrowed by oxen and top-dressed with 2 cwt. superphosphate, 1 cwt. bone-meal, and 1 cwt. phospho-guano; 10 acres were sown with Swiss oats, which yielded a fair light crop; 10 acres were sown with Sandy oats, giving a heavy but late crop. As an experiment, a small piece in the middle of the oats was prepared by twice "discing" instead of ploughing it; the result was a failure.

The south side of this field is in turnips and swedes, dressed with $2\frac{1}{2}$ cwt. superphosphate, $2\frac{1}{2}$ cwt. bone-meal, and 1 cwt. phospho-guano. The turnips are on the east side; the land was "disced" twice over in May and sown early; the grass was not killed, and the crop was much injured by leather-jackets (the grub of the *Tipula* or daddy longlegs), the roots that remained grew well, and there was about three-fourths of a crop in August. The west side was ploughed by horses, "disced" in spring, and well dunged. The snow prevented late autumn or winter-ploughing, hence the weeds are strong, but the swedes are also strong and vigorous.

No. 7 (58 a. 2 r. 3 p.), a field of deep peat. The pipes were laid here, as in other places where they could not be laid in a solid subsoil, on narrow boards to keep them in position. After draining, 13 acres of the softest land were trenched by hand,

and the rest of the field was worked by the steam-plough in 1875; oats were sown with rye-grass and clover in 1876, but yielded a miserable crop of 4 bushels per acre. The seeds were grazed in 1877, 1878, and 1879, each year giving a poor crop; it might have been better to substitute rape for clover on ground so ill prepared for it. The worst part of the crop was found in June 1877 to be on the land that had been trenched by hand. The turf was very dry here; the surface was better where it had been pressed down in the ploughing by steam, but where roots had been pulled out in winter eighteen months previously, the big holes were still soft at Midsummer. This field requires redraining.

The stock kept on this farm in 1877 and 1878 fluctuated considerably. From 300 to 900 sheep were grazed upon it; 70 Highland cattle were wintered upon it, and 30 cows were calved down. As soon as the hoggets were sent back to the hills in spring, the ewe-flock was brought in for the lambing, and when these left, the wether hoggets were brought back again. In the winter of 1878–79 the only stock kept on this farm were 46 Highland stores, 12 cows, and the hoggets. There was less straw and consequently less stock than in the previous winter.

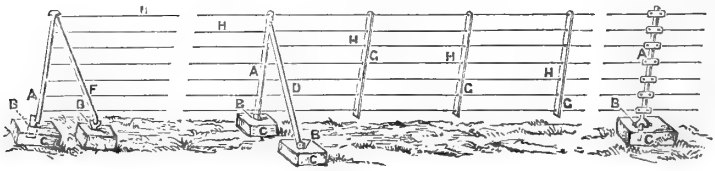
Steam-power is employed by the Master of Blantyre for most of the haulage and much of the cultivation of his two farms. A part also of the work is done by oxen. The only horses kept are five on each farm for ordinary work, and one for the road and light work. The steading at Achnanerain has a central threshing-barn, with granary, storehouse, and working-floor over it; stabling for 9 horses, stalls for 32 cows, and two large covered courts for store-cattle. There are four good stone-built cottages under one roof, viz., two on the ground-floor and two on the first-floor; so arranged that they could be easily converted into a single farm-house. There are also two sets of double wooden huts, thus giving accommodation to eight families in all.

As it is intended to use steam-power as much as possible for the ordinary tillage operations, every field on these farms has a firm road to carry the engines on two of its opposite sides; wherever it is possible, each of these roads is made to serve as the common headland for two adjoining fields: on an ordinary arable farm where fences are not required there is no difficulty in this arrangement, but on a farm intended for grazing sheep it is desirable to have each field completely fenced off from the rest, and if a permanent fence is put up, a permanent headland must be formed on each side of it.

To overcome this difficulty the Master of Blantyre has in-

vented a folding fence, which has been patented in the names of himself and Mr. George Greig. The fence is of steel wire with jointed standards and adjustable stays. It is shown in Fig. 6, where A A are iron standards jointed by a pin-joint at their lower end to short iron pegs, B, secured to blocks, C, of stone or other material imbedded in the ground; D, are stays,

Fig. 6.— *Patent Folding Fence.*



pin-jointed at their upper end to some of the standards A, and at their lower end connected by a pin to short pegs, E, of iron projecting from blocks of stone or other material, also imbedded in the ground. If the stays, D, are disconnected either from the standards, A, or pegs, E, the fence can be folded down. The end posts of the fence are kept upright by struts, F; these struts similarly turn on a pin-joint at their lower end, so that the wires, H, of the fence remain taut even when the fence is folded down; G G are uprights intermediate to the hinged standards, A; they simply couple together the several wires of the fence, but are not secured to the ground.

On level ground the straining posts are put 180 yards apart, the standards, A, 14 yards, and the uprights or light droppers, G, 2 yards apart; two sizes of wire are used, three of No. 8 and the other four of No. 10. In order that a light fence may be sufficient for cattle and horses, sharp spikes are to be fixed to one or more of the wires. Where twisted wires are used, spikes of wire will be twisted at intervals into them; where the fence wires are single, short pieces of wire will be bent round them, leaving their sharp ends projecting.

The same patentees have recently brought out a Traction Engine, specially adapted for use in winter over the partially finished roads that in reclamation work often have to carry heavier traffic than they are fitted to bear on the ordinary method; the engine is also fitted for rolling land and for driving a reaping machine. At the rear of the driving-wheels the frame of the reaper is carried on three wheels, two of which are in swivels; a finger-bar and knife are hung by links in such a manner that they can rise and fall to adapt themselves to inequalities, and so that they project out at one side of the machine. The axis from which the knife receives its to-and-fro motion is driven by means of two straps and a drunken wheel. The

beaters and rake are driven by a pitch chain from a wheel on the same axle as the hind-wheels of the engine. The wheels of the traction engine are formed so that rings can be put on one or both sides of them to form them into rollers, so that the front and back wheels together cover a strip of ground equal to the entire width of the engine; in this way the land can be rolled at the time of reaping. I saw a piece of Sandy oats cut by steam on the Colabol Farm, in field No. 5*a*, on the 5th of September 1878. A 3-horse traction engine was fitted with a roller 3 feet 10 inches wide instead of fore-wheels, each hind-wheel was 1 foot 10 inches wide; the engine thus rolled a total breadth of 7 feet 6 inches. The knife of the reaper was 6 feet 6 inches long, but it is intended to use much longer knives when the machine is perfected. The time of the trial had been arranged beforehand, and the weather was anything but propitious, as a drizzling rain was falling. The crop was heavy, with a stout straw of very uneven length, varying from 3 to 5 feet long, while a fair growth of clover increased the difficulty of cutting in the rain. In spite of this, the work was well done, until the crop found out a weak point in the adjustment of the rake, which was placed too near to the divider; the wet straw got choked up between the divider and the edge of the rake, when the latter broke, and so put an end to a trial continued long enough to show that the mechanical parts of the problem were solved, although no conclusion could be drawn from it as to the economical result of substituting steam- for horse-power in reaping.

Achadaphris.—Farm No. III. (Fig. 1, p. 411) contains eight arable fields and two large enclosures of outrun or rough pasture, fenced in, and intended to be worked in connection with the arable land and gradually improved. The outrun on the north-east contains 214 acres, and that on the north-west 343 acres. The reclamation of this farm was commenced in 1875, most of it was cropped in 1876, and the whole of it was under crop in 1877. Up to that time it had been under the control of the engineer, Mr. Baxter, upon whom the main part of the work of reclaiming these farms had devolved upon the death of Mr. Murray. At Midsummer, 1877, the reclamation work ended and Mr. Baxter handed over the farm to the Master of Blantyre, who undertook to superintend the management of it for the Duke of Sutherland.

In describing farms Nos. I. and II., I have noticed the injury done by letting large pieces of peat become thoroughly dried before they were broken up. In the reclamation of Achadaphris a great number of experiments were tried to discover the best method of breaking-down peat that was too tough to be torn

to pieces by ordinary harrows. One machine was constructed like a cultivator with half of its tines turned backwards instead of forwards and made sharp to cut the land like a knife, while the other tines were in the usual position, and tore the ground upwards. This implement, however, left the turf far too much exposed to the atmosphere. Among other failures, a piano-cultivator was tried, in which the tines were hinged from a centre and carried behind on an axle on which they fell. These tines played up and down with the inequalities of the surface of the land, and were preceded by a disc placed on rollers.

Almost all the machines tried were apt to get choked by the fibres of the peat or turf after it had been loosened.

In the autumn of 1876 the "Discer" was invented and patented by Mr. George Greig, whose name has been mentioned as a patentee of other inventions, and who is now superintending the great scheme of reclamation which the Duke commenced farther to the north as soon as the reclamation of these Lairg farms was completed.

In reclaiming land, the great desideratum is to keep the original surface turned down in the bottom of the furrow until it is sufficiently rotten to fall to pieces when turned up again; but at the same time it is necessary to comminute enough of the inverted surface of the furrow to give soil sufficient for a seed-bed. These two results are admirably achieved by the use of the "discer." Fig. 7 is an elevation, and Fig. 8 is a plan of this implement. A A is a rectangular frame carried upon four wheels, with a seat, B, for the steersman; the two long beams, C C, are riveted at right angles across the frame, and the extremities of these beams are connected by strong chains. The sharp iron discs, D D, revolve free upon the two axles, E E, each eight feet long, which are riveted at any desired angle to the chains. The discs cut the peat or turf to a depth of from two to five inches; being set at an angle to the line of draft, each disc acts as a small mould-board and throws the surface-mould into a little furrow. The discs can be mounted upon axles of various lengths to suit the angle required for the work to be done. The flexibility of the chains that carry these axles allows the implement to accommodate itself to the irregularities of the surface. The "discer" is driven at a much quicker pace than the plough, and the faster it travels the more effectually it does its work. With the largest size implement, the improvement in the work, when 16-horse engines were used instead of 14-horse engines, was most extraordinary. A "discer" covering a rather smaller breadth of ground would be equally effective, and the draft of the implement being less than that of the plough, it might be drawn by the steel ropes that had become too much worn for use with the

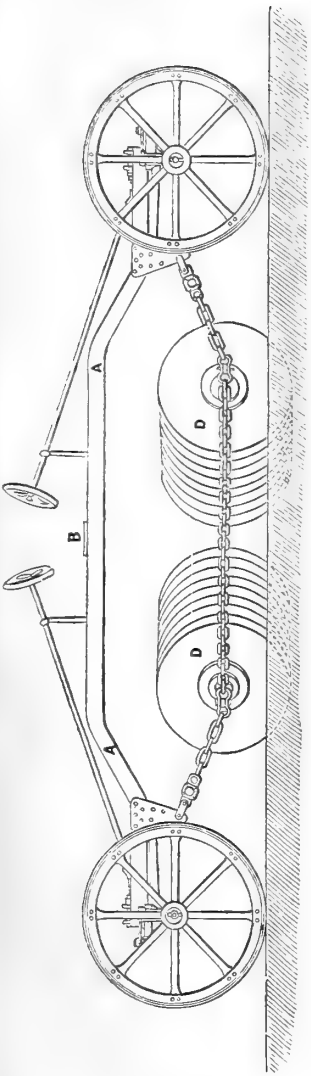


Fig. 7.—*Elevation of the "Discer."*

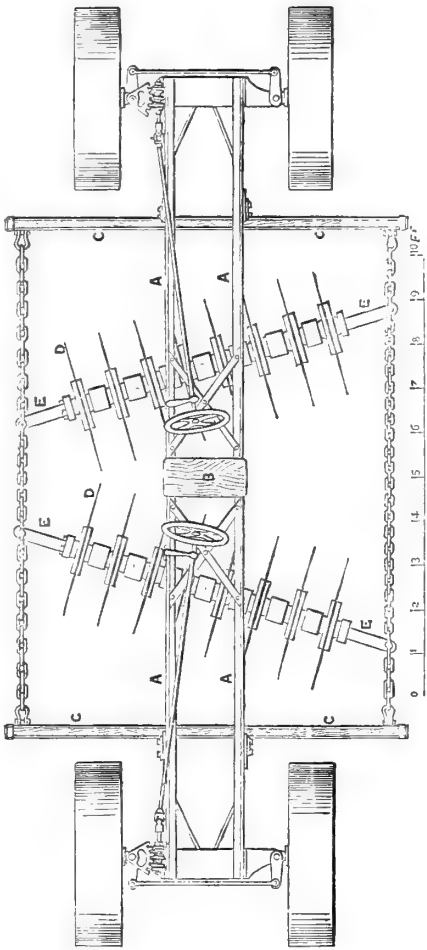


Fig. 8.—*Plan of the "Discer."*

plough. It may be noticed that in its present form the two sets of discs do not balance each other, but have a tendency to twist the implement round obliquely to the line of draft; this tendency to twist is overcome by the steerage of the broad travelling-wheels, but the friction of the discs upon their spindles thus produced is very great. In consequence of the use of the "discer" I did not find upon the Achadaphris farm any of those troublesome pieces of light, dry fibrous peat that were seen on some of the fields of the No. I. and No. II. farms.

On Achadaphris farm, fields No. 2, 3, 4, and 7 are deep peat, drained with pipes at a depth of 4 feet 6 inches; the drains in fields Nos. 1, 1*a*, 5, and 6 are about half of them pipes and half stones. The pipe-drains cost less per chain, but they require to be put close together in the peat.

Field No. 1 (35 a. 1 r. 24 p.) was in oats in 1876; in 1877 swedes—a good crop; 1878 Swiss oats—a good crop. These oats were the first ripe on the farm, and cutting commenced on the 24th of August 1878. The southern side of the field is deep peat; here the oats stood well, and were cut by machine. At the northern side the soil is hard; here the oats went down, and had to be cut by the scythe. Grass-seeds were sown with the oats. As soon as the crop was cleared hoggets were turned on to the young seeds, till the heavy snow fell and protected them. No stock was turned on to them in spring. The grass was cut by machine, and yielded about 25 cwt. of hay, saved in good condition. This (1879) is the second year that they have had a good season for hay-making. The clover was good, except on 3 acres of old crofters' ground, where the natural grasses smothered it.

No. 1*a* (34 a. 1 r. 33 p.), in 1876, oats; 1877, turnips—a good crop; 1878, Swiss oats—a good crop. In 1879 hay, similar in treatment and crop to the last field.

No. 2 (76 a. 2 r. 25 p.), in 1876, oats; 1877, stubble, "disced" by steam and sown with Longfellow oats. A description of the harvesting of this field may serve as a sample of what occurred over the four farms in the disastrous harvest of 1877. The number of acres under oats on the four farms being very great, the workmen, whose wages had been already considerably raised on the reclamation works, seized the opportunity to demand for harvesting a price per acre that was considered unreasonable: a delay occurred in supplying their places, but at length a full staff of hands was procured. The crop in this field was very heavy, and so much lodged that the whole of it had to be cut by hand. In the middle of the cutting a heavy fall of snow stopped the work: as soon as this was gone, as many hands as possible were crowded into the field, and at one

time there were 100 people at work in this one large field. As the corn was not in good condition, it could not be carried at once, but was put up in "huts" or "screws," i. e. about 20 sheaves were put together in a large round stook and capped with one or more inverted sheaves well spread out.

A part of the crop had been got into the rick-yard, when the hurricane of November the 22nd swept away the field-screws, and blew the ricks down in the yard, strewing the fields and choking all the ditches with oat-sheaves. After this the men lost heart, and if the Master of Blantyre had not spent a dreary winter on the spot, the fields would never have been cleared of the wreck of a once luxuriant crop. They were carrying oats at Christmas: and late in January they were still clearing the fields of wet straw and rotting grain. In 1878 the stubble was "disced" by steam, harrowed, and rolled by horses and oxen, and sown by hand with rape, clover, and grass-seeds. A self-sown crop of oats, shed during the disastrous harvest of the previous year, came up and grew vigorously. There was such a full plant of oats, that if it had not been for the rape the whole field would have paid to leave till harvest time. As it was, 30 acres were cut early in August, made into a sort of hay, and stacked. The rest of the field was cut and sheaved early in September. The oats would have been a good crop, but the rape was from 6 to 30 inches high, and much of it was consequently up in each of the sheaves. To prevent heating in the stack, ingenious frameworks were erected for ventilation, and round these the sheaves were built up into small circular stacks: as soon as it was high enough to form the roof, four poles were put up against the sides of the rick, and cross poles were fastened on these; the conical roof was then built up so that its weight rested upon this external frame without pressing down upon the rick itself. This contrivance answered its purpose well, and the oats were thrashed out without difficulty. After harvest the stubble showed a good plant of seeds. The vigour and rapidity of growth of the rape in this field seems to indicate that this plant should be more largely grown than it has hitherto been on newly reclaimed land in Sutherland. 400 to 500 hoggets were turned on to the rape and seeds in the autumn of 1878, and they throve splendidly, being in the opinion of Mr. McTarvis, the grieve, the best in the county. They remained till the beginning of November, when they went to the turnips in No. 5. In spring the ewes and lambs were put into this field; the grass helped the milk until its growth was checked by drought. Since then 83 Highlanders have had the run of the field; their hoofs are doing harm, but there is a good plant of grass and clover.

The drains at the lower end of this field in 1878 showed much oxide of iron at the outfall of the pipes. In 1879 some of these drains burst in the middle of the field, and the surface above them is covered with an ochreous red deposit.

No. 3 (71 a. 0 r. 6 p.), in 1876, about 20 acres in oats, the rest of the field not cropped; 1877, oats and seeds; 1878, young seeds fed till May, then dry weather set in and the land remained bare till June; a light crop of about 12 cwt. of hay per acre was cut and carried without rain; the aftermath was good. Sheep and cattle remained here till November. The hoggets had the run of the field while they were feeding the turnips in No. 5, but all the farm was covered with snow and ice from November to March. Ewes and lambs were here in 1879 from 15th to 26th of May, and cattle since then.

No. 4 (71 a. 0 r. 1 p.). In 1876, oats, a bad crop, sown late; 1877, oats again, a very good crop, except in a few spots where the drains had been injured by working the land in winter by steam; 1878, hay, a similar crop to that in the last field. The subsequent treatment of the two fields has been alike. Several of the drains are choked.

No. 5 (72 a. 1 r. 4 p.). In 1876, about 45 acres in oats, the rest of the field not cropped; 1877, oats, a good crop, except on some wet patches; 1878, the land was "disced" in winter, 10 acres of deep peat were sown in April with oats, a bad crop, followed by Swiss oats in 1879; 14 acres in swedes, drilled 25th May, suffered from drought; these were all carted off and followed in 1879 by Sandy oats; 46 acres Aberdeen turnips received 3 cwt. of fish manure and 2 cwt. of superphosphate per acre; a small part drilled in the end of May were stunted in growth, the bulk of the crop drilled in June was much better; the turnips were all fed off on the ground. In spring 1879 the whole field was "disced" and harrowed by steam, and sown broadcast with oats. This was a fair crop, except in places where, in preparing the land, injury was done by fir-roots that were caught by the harrows, and could not be removed by the man without assistance. No artificial manure was applied for the oats.

No. 6 (83 a. 2 r.). In 1876, oats; 1877, grass-seeds, received 2 cwt. superphosphate, 1 cwt. of nitrate of soda, and 1 cwt. of salt; they were cut for hay, yielding a fair light crop; 1878, pastured by sheep and cattle; the surface of this field is very uneven, and it would have been better to take a crop of rape or a second crop of oats before sowing it with grass; the west end of the field is hard land drained with stones; the east end is deep peat pipe-drained, and a deposit of oxide of iron is forming in some of the drains. Several of the drains were taken

up and relaid in 1878. One side of this field is fenced with big roots of fir laid side by side. Fir that grows in bog never sends its roots downwards, but spreads them out horizontally; when these roots are laid on their side they make a rough and rustic fence of from 5 to 7 feet high that will be sufficient to keep in even Highland cattle. In 1879 this field was broken up and cropped with 40 acres of oats on the north side, 30 acres of turnips, 10 acres of swedes, 2 acres of potatoes, and 2 acres of vetches. The whole field has been dunged. Swiss oats were sown on 20th May on land ploughed in March and April by horses and oxen, and then "disced" by steam. The oats came up well, but were eaten by the leather-jacket grub, and yielded a very poor crop. The land for turnips was ploughed by horses, part in autumn and part in spring. It was sown at the end of June with 2 cwt. superphosphate, 3 cwt. quarter-inch bones, and 1 cwt. phospho-guano; the plant was eaten by grub, and the land resown late in June. Ten acres of swedes sown 15th of June, half of them were destroyed by grub; the blanks were filled up with turnips. All the roots were promising well in August. The potatoes were a fair, and the vetches a good crop.

No. 7 (30 a.). In 1877, oats; 1878 and 1879, grass, a good crop, grazed by sheep and cattle. The steading on this farm is similar to those on the other farms, but as the set of buildings on the next farm is considered to be an improvement upon the plan of the others, it will be best to defer giving details until that farm is described. It should, however, be mentioned that a combined school-house and church of corrugated iron was erected by the Duke for the accommodation of the workmen and their families, in a central position on this farm. On the night of the hurricane this building was unfortunately burnt to the ground, the windows were probably blown in, and the hot embers then blown out of the grate.

His Grace has recently erected a new school-room on an excellent site a little further to the west, near to the Kenneth Murray obelisk. It is rented by the School Board of Lairg. In a casual visit in August 1879, a fortnight after it had been opened, I found 40 children attending it, all of them from families engaged in work on the reclaimed land. To a southern eye the bare feet of a Highland school gives at first sight an appearance of picturesque wildness to each class. A brief examination, however, soon showed that, with much of mountain shyness, activity, and health, there was no lack of intelligence; the reading was good and the discipline excellent. During the rebuilding, school was carried on in a cottage, and the attendance in the winter months was upwards of 60.

Lubvree.—On No. IV. farm ploughing was commenced in May 1876; three double-engine sets of tackle were employed, and the work was pushed on with such marvellous celerity that the whole of the farm was under crop in 1877. It might be expected that when 350 acres were sown with oats and 50 acres with turnips, on land that had a few months previously been unbroken moor, much of the seed would prove to have been wasted. It says much for the efficiency of the "discer," that with a very liberal application of artificial manure, a crop of oats was obtained that, in July 1877, gave a promise of yielding an average of from $4\frac{1}{2}$ to 5 quarters over the whole breadth. In previous years nitrate of soda and guano were tried for oats, but gave much straw and little corn. The dressing for oats in 1877 was 4 cwt. of superphosphate per acre, on each field of the No. III. and No. IV. farms; but in 1878 and 1879 the top-dressing for oats was reduced to 2 cwt. of superphosphate. This farm is intended to be under a six-course rotation, viz., oats; three years grass; oats; and lastly turnips. Fields Nos. 2 and 9, 4 and 8, 6 and 7, will be cultivated together, and in this way there will eventually be 70 acres under each course of the rotation; oats were considered to be the most profitable crop for newly broken land, and the whole farm was therefore put under oats, except 50 acres of turnips and 3 acres of peas. It is a very costly process to attempt to reduce newly broken land to a fit state for sowing turnips by merely mechanical means; the tilth thus obtained can never be equal to that which has been gradually mellowed down by long exposure to atmospheric influences. It was, however, considered so important to secure some turnips at any cost, to be consumed with the great quantity of straw on this farm, that the attempt was made in two of the new fields.

Field No. 1 (68 a. 1 r.). In 1877, 30 acres in oats, a good crop; 3 acres peas, poor; 37 acres of turnips, a poor crop, in spite of very thorough and expensive tillage; 1878, the whole field was twice cultivated by steam, and then harrowed by steam. As there was not time to "disc" the land it was thrown into open furrows; a dressing of 16 loads per acre of dung having been put in with 3 cwt. of superphosphate, 2 cwt. of guano, and 1 cwt. of crushed bones, the ridges were then closed and the seed sown, viz., 30 acres, at the south end, of swedes after oats, and 40 acres, on the north, of turnips after turnips and peas. The turnips were a very good crop; but the swedes suffered for want of rain, they covered the ground well on the 1st of September, but were uneven in size, the surface of the land being rather rough for want of "discing." No roots were fed on the land, but both turnips and swedes were carted off. The land after turnips was ploughed by horses, that after

swedes was "disced" by steam. Sandy oats were sown over the whole field. A fair crop; best where the land was ploughed.

No. 2 (35 a.). In 1877, oats, a good crop, except where the ground was very rough; 1878, cultivated and harrowed by steam, ridged, turnips drilled from 24th to 30th June, with 3 cwt. of superphosphate, 2 cwt. guano, and 1 cwt. crushed bones. In September the crop had covered the ground, and the bulbs, though not large, were growing well. They became a fair crop; half the turnips were lifted, and the rest was fed off by sheep. In 1879, 3 acres were planted in May with potatoes; the rest of the field was sown with Sandy oats, receiving 2 cwt. superphosphate, and yielding a very good crop, the best on the farm.

No. 3 (67 a.). In 1877, oats, good at the west end, but poor at the east end; 1878, "disced" in spring, 6 bushels per acre of Swiss oats, costing 52*s.* per quarter, were sown broadcast, and harrowed in by steam; about 10 acres of the thinnest part of the west end of the field were cut green and ricked in the field to be eaten by cattle; the east end of the field gave a good crop. We have here a very striking example of different effects of soil and season in the same field. The western portion of the field lies higher and drier than the eastern, consequently in the wet summer of 1877 it gave the best crop; but in the dry summer of 1878 it appeared to be too dry, and the crop failed; on the other hand, the low-lying east end of the field seemed to be insufficiently drained in 1877, yet in 1878 it gave the best crop. The 57 acres that were reaped yielded 227 qrs. of clean oats, or 4 qrs. per acre. In the autumn, 29 acres were ploughed by horses, "disced" in spring and sown with turnips; 38 acres of young seeds were doing well in August 1879.

No. 4 (55 a.). In 1877, oats; 1878, "disced" and harrowed in spring, and sown with 6 bushels Swiss oats. The produce was 225 qrs., or 4 qrs. per acre. In the spring of 1879 the stubble was "disced," harrowed, and rolled by steam, and sown with 5 bushels of Swiss oats, with the usual allowance of 2 cwt. superphosphate. 13 acres were also sown with grass-seeds. The oats in August were a moderately good crop, with less straw than in the two previous years.

No. 5 (67 a.). In 1877 oats, seeded with clover and grass; 1878 and 1879 very rough grass, consisting chiefly of Yorkshire fog; the clover and artificial grass-seeds were wasted, the newly reclaimed land had been tilled sufficiently for oats, but not made fine or mellow enough for these finer seeds. The outfalls of the drains on the east side of Nos. 2, 3, 4, and 5 are many of them useless. Several drains have been lifted, and found to be full of ochreous deposit.

No. 6 (34 a.) and No. 7 (31 a. 2 r.). In 1877 oats, a good crop, except on certain patches of brown moss; in 1878 limed, "disced," and sown in June with rape and grass-seeds; in September 1878, the seeds had already been fed down, but the plant looked strong and healthy. For want of thorough draining, these seeds have since deteriorated. In 1879 the No. 6 field was dressed with 5 cwt. of mixed superphosphate and bone-meal; it was fed till April, and then laid up. A poor crop of hay was cut on the 11th of August.

No. 8 (14 a. 1 r.). In 1877 turnips and rape; 1878, limed, "disced," and sown in June with rape and grass-seeds; a good crop. For similar reasons this grass did not do well in 1879.

No. 9 (33 a. 2 r.). In 1877 oats, a good crop; 1878, "disced," harrowed, and sown with Sandy oats. The yield was 112 quarters, or 3 quarters 3 bushels per acre, exclusive of the rakings. The oat-stubble was ploughed up by horses in autumn. In spring 1879 the hard land was cultivated, and the soft land "disced" and harrowed by steam. Turnips were sown on 27th June with 5 cwt. of superphosphate and bone-meal. While "discing" in May and June the peat soil was so dried up by the drought that it caught fire wherever the ashes fell from the engine, and it was necessary to keep men with pails of water to put it out.

The brief life of this farm has been of a somewhat sensational character. In 1876 the site was bare brown moorland; in the early autumn of 1877 it was covered with luxuriant crops, and nothing agricultural could well look more triumphant; a month later and everything was covered with snow. Then came a period of desperate struggle to save the imperilled crops, until every hope was shattered by the hurricane, and nothing could look more deplorable and dreary than these same fields, encumbered with the rotting wrecks of their former pride. The history of that harvest, as told by Mr. Suter, the grieve, was quite a moving tale. In consequence of the difficulty with the labourers, cutting did not commence until the 10th of October; snow began on the 12th, and stopped all work till the 23rd. Then every hand that could be obtained was hard at work; the ground was too soft to carry a reaping-machine, and all the corn had to be cut by hand; on one day Mr. Suter counted 62 scythes at work at one time. At length, on Friday, the 15th of November, the whole 345 acres of oats were tied in sheaf. About 50 acres of the land was firm enough for carts, and was cleared by the farm horses and all the animals that could be obtained on hire. On Sunday morning the grieve thought he saw signs of a coming change of weather and went round to ask the men to turn out and save the crop. They listened in silence and looked glum; he

then asked them to come to work at twelve o'clock that night. To this they readily assented. They kept their promise, and at midnight mustered well. They rooked all the crop in screws in the field before the clearing of the softer land by steam began. All was ready on Wednesday night; two engines were started to work day and night without intermission, drawing huge sledges to the headlands; each sledge was piled high till it carried a stack of corn; as soon as it reached the headland a cast of a rope was put round the stack and the whole load pulled off the sledge *en masse*. Seventeen horses were employed carrying the corn from the headlands to the rick-yard. On the following night, Thursday, the 21st of November, it commenced to rain and blow hard about eleven o'clock, and the storm increased in violence till three o'clock in the morning. Two long and four round ricks were blown over in the rick-yard and scattered, the fields were once more strewn with corn from the field-screws; the open ditches were choked, the school-room was destroyed, and four large skylight window-frames were blown from the roof of the steading across the yard and shattered. It would have been better for the farm if the whole of its 345 acres of oats had been destroyed by fire; it was a dreary and tedious task to clear the fields, and the cost of the labour expended in the work far exceeded the value of the rotting straw and grain.

There is happily no reason to believe that the Lairg district is more liable to such storms than other places, or it would be a very serious objection to its tillage. Farms in Ross and Caithness, that had been long under cultivation, suffered equally from the hurricane, and many a rick on the coast of Caithness was that night blown bodily out into the sea. There was nothing extraordinary in the cultivation of this farm in 1878. With the exception of 40 acres cut by contract, all the oats were cut in 11½ days by one machine, and, without being put up in screws in the field, all was carted into the rick-yard by the 21st of September. The dry season was unfavourable to the growth of the oats. Owing partly to this cause and partly to the fact that they received but half the quantity of artificial manure, the crops of 1878 were not nearly so strong as those of 1877. The statement of the yield from each field is obtained by counting the ricks and taking for their contents the average yield of those of them that had been threshed out by the end of January 1879. Three ricks of the rakings were not reckoned in; had they been included, the average yield of every acre reaped upon the farm would have been fully 4 quarters—a very modest yield, but it must be remembered that every patch of raw or rough ground helped to lower the average considerably.

There were wintered in 1878–79 at Lubvrec 340 three-year-

old wethers, 70 polled bullocks, 5 cows, and 6 working oxen. About one-third of the oat-straw was eaten by the sheep, and the grieve states that they took it in preference to the hay. The rest of the straw was given to the beasts, and the greater part of it trodden into dung.

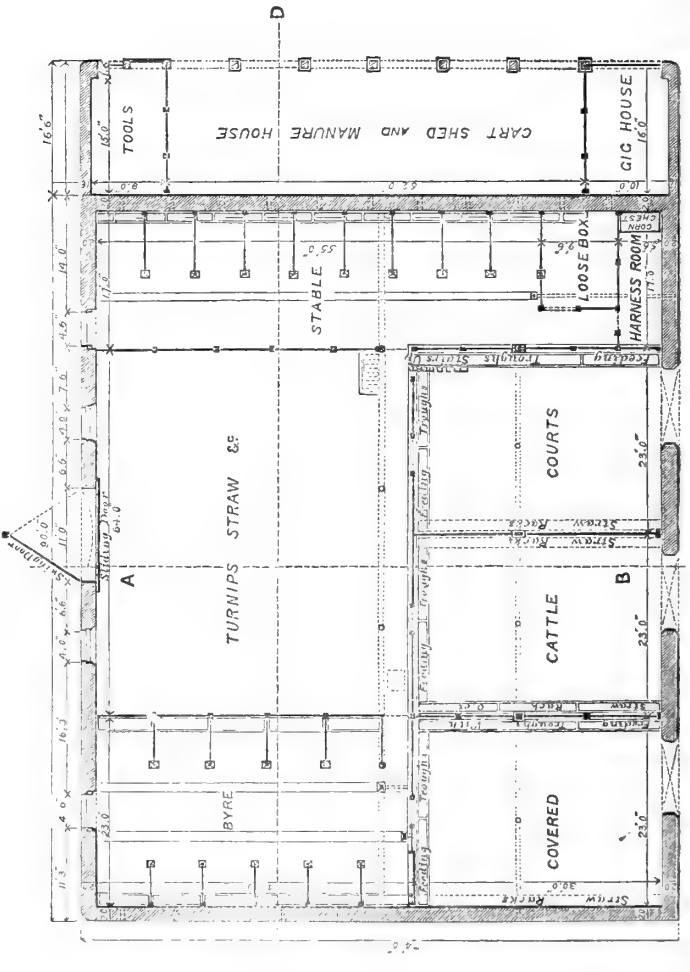


Fig. 9.—*Plan of Farm-Steading at Lubmee.*

The grass-seeds on the Nos. III. and IV. farms were rolled by a heavy Cambridge roller, drawn by steam, but the result was not nearly so good as that obtained on the Nos. I. and II. farms by the much more efficient rolling done by the little traction engine. A very marked improvement has also resulted

on the Nos. I. and II. farms, from feeding sheep with roots and other food upon the grass last winter.

For the accommodation of the labourers at Lubvrec there is a large wooden bothy and four excellent stone-built and slated cottages.

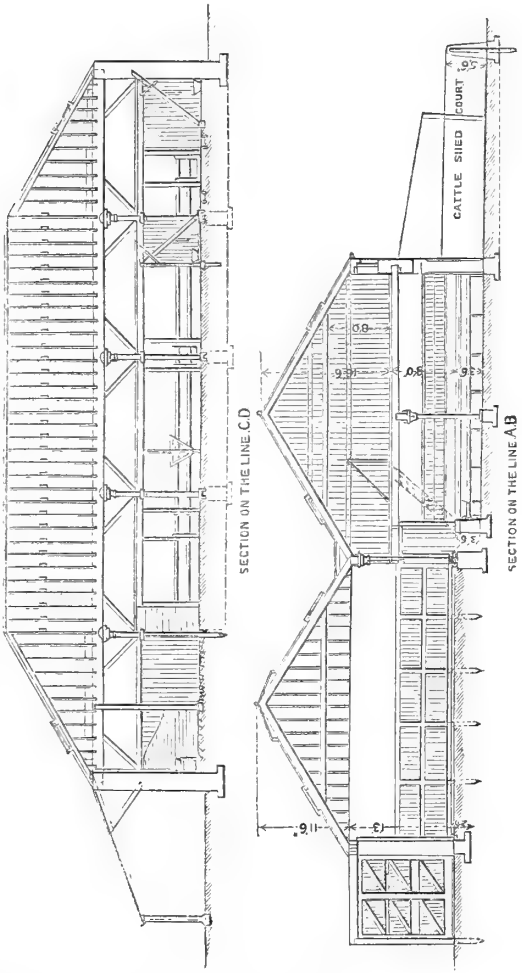


Fig. 10.—*Sections of Farm-Steading at Lubvrec.*

From the plan and sections (Figs. 9 and 10) given of the farm-steading it will be seen that the whole space is roofed-in. The main walls enclose a rectangular space of 90 by 74 feet, well lighted from the roof; adjoining this central block there is on the east side a range of cattle-sheds 20 feet deep, with open

courts extending 7 feet farther; and on the north side are the cart-shed and manure house, 16 feet 6 inches deep. The whole block of buildings thus forms a square of more than 100 feet.

The floor of the central barn, as shown in the section A B, is well raised above the level of the cattle courts; a large threshing-floor with a granary and store-rooms for cake, &c., extends over the cattle courts. As the site of the buildings is much exposed, there is a special contrivance to prevent rain or snow beating into the barn when the door is opened to admit a load of corn or turnips; before opening the sliding door the external swing door is placed so as to close the windward side and protect the inner door from the drift. The roof is of slate, in two frames, resting in the centre on iron pillars, and the walls are of stone obtained in the reclamations. This set of buildings has cost about 2000*l.*—a large outlay upon a farm of little over 400 acres, but yet not an extravagant sum for buildings of this size very substantially erected. The mere roofing-in of 10,000 square feet is of itself very costly, while all the internal fittings are of a good and substantial character. The question may, however, be fairly raised, whether an arable farm intended chiefly as an adjunct to a sheep farm requires a set of buildings of this size. Had there been less accommodation for cattle, it is probable that the straw would have been better utilized, and more of it would have been eaten by sheep. In the reclamations that have been recently set on foot it is the Duke's intention to defer as long as possible the erection of any but the most necessary part of the buildings, thinking it better to be guided in this matter by the wants of a tenant after a few years have shown clearly what his system of farming requires.

It is intended that 384 acres of grass lying on the north-west of this farm shall be improved for pasture. The natural herbage on this land contains a large proportion of fog-grass and of the deer-hair (*Scirpus cæspitosus*), a species of small sedge that shoots up like a thick braird of corn in the middle of May, and provides food for stock till the month of August. The land was first drained with pipes and stones two chains apart. The dry grass on about 20 acres was accidentally burned in March; this part was afterwards dressed with 5½ cwt. of common salt, and ½ cwt. of superphosphate per acre, and in the following June it presented a bright green appearance to the eye. It was not convenient to leave this piece out of the general cultivation, and it could not, therefore, be judged how long the improved appearance would have lasted. In the summer of 1877 the whole of the 384 acres were "disced" twice over. This operation tore up a good deal of the tough fibrous root of the deer-hair, and at one time it seemed likely that the whole of

these roots would be dry enough to burn on the surface; unfortunately the season was unusually wet, the roots became dry enough to be afterwards troublesome, but not dry enough to burn. To test whether any good could be done by sowing the land as it lay, a small plot was fenced in and sown with eight different applications of seeds and manures. As none of them produced a decent crop, it will be unnecessary to enter into details. On inspecting the different plots in September 1878, the nearest approach to a crop was found on a plot manured with lime and sown with a mixture of rape and grass-seeds. An attempt was made to plough a part of the "disced" land by oxen, but the loose stuff hung on the plough, and the oxen were not strong enough to do the work satisfactorily. Besides eight horses, four working oxen have been kept at Lubvrec, namely, a pair of Swiss beasts that have proved excellent workers, and one pair of cross-bred cattle. In 1878 the land was ploughed up by a pair of 12-horse engines and a Sutherland plough. The work was much impeded by the plough becoming frequently choked up with the loose surface stuff that had been worked up by the "discers." This prevented the engines from getting through more than 12 acres a-week. They would have made much better progress if the plough had been set to work upon the land before the "discer" had touched it. About 100 acres of the land thus ploughed was "disced" again from May to July 1879, limed with 18 bolls per acre, harrowed by steam, and sown with rape and grass-seeds rolled in; viz. rape, 4 lbs.; English rye-grass, 22 lbs; Italian rye-grass, 9 lbs.; clovers and rib-grass, 15 lbs. per acre. The land has been surface-drained, but the young seeds looked rusty in August and much needing sunshine. At present this experiment does not compare favourably with the more thorough work elsewhere. It is inevitable that those who make experiments, and are the pioneers of agricultural progress, should in such ways as this often pay dearly for the valuable experience which they gain.

Summary.—In the reclamation of these four farms the chief mistake has been that sufficient supervision was not provided. Mr. Baxter, the resident engineer, had not a sufficient staff of assistants to superintend efficiently all the details of the various operations that were being simultaneously carried on over a wide area. In spite of the best endeavours of those who were with him, the workmen were often left to carry out the details on their own responsibility. This might not have mattered so much with well-trained workmen, but, with the class of labourers who first sought employment, it was fatal. Lime was spread very unevenly, and drains were very badly laid. This has been clearly seen when lifting drains that had ceased to run; a rock

has even been found unremoved in the line of a drain, with pipes unconnected lying on each side of it. Though these defects are very serious, and may make the work unprofitable in a pecuniary respect, they are defects of detail rather than of principle, and do not interfere with the profit that in other ways may be derived from what has been accomplished.

The experiments on the Lairg farms have been conducted throughout upon a most princely scale, and no one will be surprised to hear that the expense of these reclamations and experiments has been very great. With true public spirit the Duke is ready to let others share fully in the lessons to be learnt alike from his failures and his successes, and has kindly furnished me with a full account of the whole amount expended upon each of the farms:—

DETAILS of RECLAMATIONS up to 31st DECEMBER 1877, on the FOUR LAIRG FARMS.

	Colabol, 345 Acres.	Achnanerain, 330 Acres.	Part of Achadaphris, 445 Acres,	Lubvrec, 405 Acres.
	£	£	£	£
Trenching by hand	71	174	136	215
Ploughing, harrowing, and "discing" by steam	4,409	2,930	3,461	2,758
Ploughing by horses	216	72	25	25
Blasting stones and clearing roots and stones	1,998	2,310	1,808	1,592
Draining open ditches	482	633	589	932
„ covered drains	3,063	2,800	3,361	2,528
„ cost of tiles	711	1,602	1,924	1,560
Fencing stone dykes	171	303	208	164
„ posts and wire, average 1*s.* per yard	700	214	167	340
Roads, bridges, culverts, and extra repairs to public roads ..	1,130	1,092	1,006	784
Tools, implements, and repairs ..	1,757	1,210	1,214	1,440
Superintendence and incidental expenses	697	598	267	268
Huts for workmen	681	413	267	168
Sundry carriages	124	44	133	28
Other expenses not detailed ..	..	..	..	756
	16,210	13,795	14,566	13,558
Expended on 30 acres now added to Achadaphris	..	..	986	..
Expended on improved pasture	..	..	..	1,837
Total	16,210	13,795	15,552	15,395

These figures are printed as an interesting record of what has been spent at Lairg, although they give very little indication of what would be the cost of reclaiming land by steam-power under ordinary circumstances.

Mr. John Fowler is said to have spent 30,000*l.* before he commenced to sell machinery for ploughing by steam. It would have been a strange mistake to argue that each set of tackle he sent out must therefore be almost as costly as the first. It would be equally erroneous to conclude that the very large outlay that has been incurred in the first application of steam-power to such work as this is any fair criterion of the cost of applying it afterwards in a systematic instead of a tentative manner.

Happily, his Grace is not the man to be easily discouraged by the difficulties that commonly attend the commencement of any great and useful undertaking. He might otherwise have been daunted not only by the expense, but even more by want of support from his tenants. It might have been anticipated that the men of Sutherland would have been found following their chief as of old, shoulder to shoulder, with an intelligent perception that victory in this fight would mean increased prosperity for the county and themselves. But, with a few exceptions, among whom the Master of Blantyre stands first, the rest of the tenantry have as yet been content to look on without giving the aid that they might have rendered. In the autumn of 1877 notice was given that the turnips on two of the new farms at Shinness were for sale for consumption on the land. Several of the tenants drove their sheep along the high road past the farms, to be wintered out of the county, without once asking the price of the home-grown roots. Turnips grown on old land are generally of better feeding quality than the produce of newly broken ground, and there was probably some fear that the land would not carry sheep well through the winter; but it was discouraging to find that none of the large sheep-farmers would venture on a feeding experiment to back up their landlord's enterprise; an experiment too that was afterwards carried out most successfully by Mr. Blake, who wintered the Duke's sheep upon these turnips with excellent results. It is also to be regretted that as yet no sheep-farmer, except the Duke's nephew, has offered to rent the newly reclaimed land at Shinness. This want of alacrity in co-operating with his Grace may be in part explained by the results of the past few seasons, which have been as unsatisfactory to the sheep-farmers in the north as to the holders of arable land in the south. At such a time men are slow to venture into new and untried branches of their business; but much of it must be set down to other and more objectionable causes.

The majority of the Duke's tenants in Sutherland belong to a class much more like the wealthy squatters (i. e. holders of large sheep-runs) in Australia than the ordinary run of tenant-farmers

of England; men with a large capital invested in their stock, who have been accustomed to leave much of the management in the hands of responsible shepherds, while they themselves, like other Scottish lairds, find ample time for field-sports and for the refinements of society. Although they may not hold the tiller of the soil in the same contempt as the Australian squatter does the *cockatoo*, who scratches the comparatively small plot of land he holds, yet it is natural that such a class should be unwilling to exchange a life of leisure for one that requires a constant attention to the details of farming. At the annual wool-fair at Inverness, the proprietor of one of the hotels was asked if any of the Sutherland people had arrived. "No," was the reply, "some of the *farmers* of Ross are here, but none of the *gentlemen* of Sutherland." It must be remembered, too, that for almost half a century the profits of sheep-farming were great. While the green lands retained their fertility, the sheep needed much less help than they do now. The landlord in those days did not suspect the gradual deterioration of his property, but was content with a low rent. The tenants grew rich as the land grew poor. Wool and store sheep were constantly sent out of the county, but nothing was brought into it to replace what they had removed from the land. So long as the owner of the soil made no complaint the tenants had every reason to be satisfied with an arrangement that, though it could not last for ever, yet yielded them a good return for their investment with a minimum of personal trouble. Within the last few years, however, there has been a considerable falling off in the profits of sheep-farming, and many of the tenants have become aware that some change must be made in their system of management. The last winter especially, 1878–1879, was most disastrous in its severity and long continuance. Over the greater part of the county the heather was buried under deep snow for weeks together, and it was with great difficulty and at very great expense that hay was carried out to keep the sheep from starving. At a meeting of the tenants at Golspie in August 1879, the chief topic of conversation was the wintering of sheep. The difficulties experienced differed greatly even on farms adjacent to one another. On the northern side of the hills there was often plenty of heath exposed, while on the southern side everything was buried beneath the snow. There was much diversity of opinion, but it was clear that the most prevalent practice was to let the ewes fight it out with the storm as long as they possibly could; when they were very near the point of starvation they were either driven to the nearest railway station to be fed there, or else food was with great difficulty taken to them. As soon as the snow melted and there was the first appearance of verdure, the

ewes were at once all sent back to the hills; the Master of Blantyre's flock alone excepted. Unfortunately, although it was late in the spring, a very severe storm set in soon after they were turned out, and great numbers of them, already weakened by their previous hardships, quickly succumbed.

There has always been much difference of opinion on the question of box-feeding sheep in winter; but it is clear that, unless it is continued until the natural food of the sheep can be obtained in sufficient quantity, any loss that ensues must be attributed not to the adoption but to the too early abandonment of the artificial feeding. In the few cases where other foods than hay were given, different combinations were adopted of maize, oats, bran, lentils, and decorticated cotton-cake. By continuing the box-feeding the Master of Blantyre not only escaped the common fate of "many skins" at the end of the winter, but obtained at speening time the unusually high average, for a highland flock, of 92 per cent. of lambs. To meet the difficulties of wintering, some of the tenants advised that the stock of sheep kept upon each farm should be permanently diminished; it is not often, however, that such a winter as the last is experienced, and it would be sounder policy to strengthen the weak link in the chain by incurring occasionally the exceptional expense of winter feeding at a loss, rather than lose every year a great part of the summer keep through understocking it. The fall of lambs this spring has been even worse than that of the calamitous season of 1877.

It is at a time like this that attention is called most urgently to those radical defects of management that are surely, though slowly, operating for the impoverishment of the county. Men who have long enjoyed the easy reception of what nature, unaided, could give them, must now bestir themselves to discharge the full duties of their position, or must give place to other men with more of that enterprise and energy that distinguish the Duke.

Under the present system, it is doubtful whether the introduction of the Highland Railway is of any benefit to the county at all, so far as the sheep-farms are concerned. The tenants have used it freely for sending away their wool and for sending a larger proportion than before of their sheep to be wintered away from home, but they have hardly used it at all for bringing in those artificial foods and manures that serve to maintain and increase the fertility of other parts of the kingdom. With a climate milder than the great feeding county of Aberdeen, there seems no reason why the opening up of the county by rail should not enable some portion of its stock to be fattened at home. In the spring of 1877 numbers of lambs were allowed to die for

want of food within a very short distance of the railway that might have brought them an ample and varied supply.

Formerly there was some excuse for the exhaustion of the land in the difficulty of transit making it impossible to introduce food or to sell stock, except in store condition. Sutherland was then, as regards transit, more isolated than many of our colonies; but it can now share in the advantages possessed by the rest of the kingdom, and there is no longer an excuse for continuing a wasteful and exhaustive system of management.

In December 1878, an inquiry was addressed to each of the sheep-farmers in Sutherland asking whether their experience indicated any important change in the land during the last twenty-five or fifty years, as regards its power of carrying sheep. Unfortunately, a very severe snow-storm came on just after the inquiries were received, and for several weeks another and more urgent question absorbed the whole attention of the sheep-master, namely, the question of preserving the flocks while their ordinary food was deeply buried in the snow.

Eleven answers were, however, received from different parts of the country.

In reply to the question, "Have you observed any indications of change in the fertility of the green-land, or the heath-land?" all, without one exception, concur in the opinion that the green-land has very much deteriorated.

The Master of Blantyre, in his reply, observes that when the crofters occupied the land, "they lived in the Straths, and only sent their stock (principally cattle and ponies) to the higher grounds when spring was well in, and brought them in early in autumn, much on the same principle as they do now in Switzerland. Owing to this practice the out ground always had a good start, the mossing and deer-hair thereby never being eaten down as it is now, and the heather was kept in good order. Good green-land was formed where the cattle were folded at night, and on the patches cultivated near the shealings. Now all this is changed. The straths and the green patches (or towns as they are called) have become fogged and mossed, while the heather has run wild and encroached upon them. The sheep are now kept out all the year round on the hills, and as soon as the mossing (cotton-grass) shows itself it is nipped off, and is therefore rapidly disappearing: a serious loss, since it is the first plant of the year, coming in about the 12th of March, and forming the mainstay for ewes in lamb." It should be noticed that the cotton-grass (*Eriophorum vaginatum*) grows among the heather on the black-land; its solid fleshy stems are pulled like leeks by the sheep in March, and it also comes into season again in October. There is not much of it to

be seen in the Shinness district, but it is still abundant in Kildonan.

Several of my correspondents say they have not noticed any marked deterioration in the black-land. From one farm the reply is that heath-land, when regularly burnt and not overstocked, is quite as productive as it used to be. Mr. Sidney Hadwin, of West Garty, finds that where the green-land was once good pasture, it is now much fogged with moss and grown over with heather. Mr. William Houstoun says that in the Achintoul district the green-land "has steadily decreased in value, and that owing to its throwing up moss instead of grass it will not now keep as much stock." He does not suppose the heath-land has deteriorated much. Mr. William Mitchell, of Ribigill, has "not the least doubt that the green-land has lost its fertility to a great extent. Grass grows quite thin and weakly, where thirty years ago there was luxuriant herbage of different kinds of natural grasses." He has improved the black parts of his farm by draining and burning, and believes that this has prevented the stock being reduced by at any rate 10 per cent.

Mr. W. J. Paterson, of Armadale, writes that he has yearly observed a change for the worse both in the green and the heath-lands.

Mr. T. Purvis, of Rhifail, says that "the green-land is gradually getting more and more exhausted, but there is not much change on heath or other pastures for better or worse."

Mr. R. Rutherford, of Kildonan, writes, "I have observed that the green-land does not grow half the grass it grew about forty years ago, and there is not the feeding substance in what it does grow there was at that time. I do not think the heath-land is much deteriorated."

Mr. P. P. Sellar, of Strathnaver, after observing that it is now sixty years since the greater part of the farms in the county were stocked with sheep, states that "green-land that had been previously cropped is poorer than it was for the first thirty or forty years after it was let out to grass. There is not much change during the last twenty years in the fertility of the *good* green-land, the light land is poorer in that time. There is a smaller *extent* of green-land, both that which may have been at one time cropped, and what was green naturally, as heather is encroaching on it to a considerable extent, for it is not allowed to be burned as formerly. There is no change in the natural fertility of the heath-land. The heath-plants being less burned, sheep are obliged to depend on the green-land more than formerly for their food. They get a much larger proportion of their pasture from the rough hill-plants than from the green-land."

Mr. Sellar's remark that "there is not much change during the last twenty years in the fertility of the *good* green-land," may draw attention to the fact that there are two descriptions of green-land in the county, which may be briefly distinguished as the natural and the artificial. The first description is comparatively rare, occurring upon the narrow belt of naturally fertile soil along the east coast, and also found occasionally inland at the base of some mountain torrent that spreads all the soil that it washes down from the hillside over a small space of level land at its foot. There is no doubt that such spots as these show little or no signs of exhaustion.

The other and most prevalent description of green-land is that referred to by most of my correspondents, and the only description contemplated in my inquiry. It is land that in a state of nature would not be covered with grass, but by an inferior herbage. It owes its fertility not to natural causes, but to the artificial "condition" put into it by the tillage of the crofters. That which man gave to it, human agency is now taking away. The natural consequence of the treatment which it has received during the last fifty years is that it is rapidly losing its grass and reverting to heather and other Alpine growths.

Mr. Sellar occupies a good arable farm at Culmalie, near to Golspie, and has of late years been in the habit of using considerable quantities of artificial food and manures upon the land under the plough. Upon the grass-land he made a single experiment six years ago, which he considered at the time to be a failure.

A small strip out of the middle of a pasture-field received a dressing of superphosphate of lime. The grass was constantly eaten close by sheep, and for five years Mr. Sellar doubted whether any beneficial result had been produced. In the present year the field was laid up for hay, and the strip that had been top-dressed six years ago was clearly distinguished by the greater luxuriance and the darker colour of the grass upon it.

Even a single experiment like this, when it confirms the teaching of agricultural experience in every other district, should go far to remove local prejudice and convince men that it is by the judicious use of phosphatic manures that the exhausted fertility of the green-lands of Sutherland must be restored, as the fertility of the Cheshire grass-land was restored early in this century by the use of bones, after it had been exhausted by the constant removal of its phosphates in the cheese sent out of the county.

While all agree that the green-land has thus become very much impoverished, there is much more diversity of opinion

about the heath-land; some have not observed any falling off at all, others report a great deterioration, while a third class think a falling off is only to be observed where burning and draining have not been sufficiently attended to. Sheep and grouse are alike benefited by the systematic burning of the heath; the work requires to be done periodically in sections, for when heath has once grown high it cannot be burned without some risk of the fire extending beyond the limits intended for it.

Where the shooting and the grazing are let to different tenants, neither the keeper nor the shepherd has the sole responsibility, each is jealous of the other, and disposed to cavil at his work, the result being that the heath is often left unburned much longer than it should be.

Information on the subject of sheep-drains was solicited by the following question: "Is surface-drainage of the heath-land extending, and if so, what is the effect?" Most of the replies are to the effect that it is extending, and with good effect. Mr. John Blake writes from Dunrobin Mains, "Yes, the sheep are more healthy, but it may be overdone where there is a grass called draw-moss, which the sheep live upon in spring." Mr. Mitchell also says that "it is extending with good results, but it has to be done judiciously, as some of our best grasses are destroyed if the ground is made too dry."

Mr. Sellar replies, "Surface-draining of land under heather is not extending, as heather does not require draining. Much damage has often been done to ling-moss and to pry by over surface-draining."

Mr. Paterson states that "it is extending and affects green-land to the worse and heath to the better, except moss-ground." Mr. Rutherford believes it to be extending, "But, if there is no mixture of grass among the heath, I do not think it will pay the farmer or improve the heath much."

Mr. Purvis says that, "Within the past twenty years the hill-grazings have been nearly all surface-drained, adding greatly to the comfort and safety of the stock from rot, &c., and no doubt making up so far for failure of green-land."

It is usual on sheep-farms to allow each shepherd the keep of one or more cows; as they get the pick of the land, their produce may afford some criterion of its condition.

To an inquiry whether the butter and milk of these cows was richer or poorer than it used to be 25 or 50 years ago, nearly all those who have paid attention to the subject reply, with more or less emphasis, that the produce is poorer in quality and in quantity. Mr. Sellar, however, knows no difference in the richness of the milk, always finding it good when he calls

at the shepherds' houses. Mr. John Kellie, of Achinduich, is also to some extent a dissentient, remarking, "it is considered poorer, but this may be attributed to the class of cows now kept by shepherds, and to the fact that all green patches are well, indeed too well, eaten down by sheep; 25 or 50 years ago, sheep were kept well out from the shepherd's house and consequently the cows had richer feed."

We have here direct evidence given by fully one-fourth of the number of the Sutherland sheep-farmers of the serious deterioration of the herbage of the county within the last 50 years. As regards the green-land the evidence is very strong and quite unanimous. Differences in the heath-land are, from its character, more difficult to note; the sheep have spread over it in their droppings some portion of the fertility stolen from the green-land, and the beneficial results of surface-draining have for a time to some extent counterbalanced that steady deterioration that has slowly but surely been going on.

A return was requested from each farm of the number of sheep that had been respectively kept at home, and sent to be wintered away each year.

A second return was requested of all the losses each year in the 12 months preceding shearing-time. It was thought that a comparison of the total number of sheep on the farm each autumn with the number reported the next summer as lost, might show whether or not the percentage of loss is increasing or not upon the farms, and would materially aid in showing the real amount of deterioration in the land. Unfortunately there is a great objection to giving such returns. The rent of each farm is based upon an estimate of the number of sheep it will carry, and an exact statement of the sheep that have been kept upon it would be almost equivalent to a statement by the tenant of the extreme value of his farm. Under these circumstances, my thanks are especially due to the one gentleman who has, with much public spirit and at considerable personal trouble, furnished me with a very valuable set of tables extending over 20 years.

Mr. Sidney Hadwin has occupied the sheep-farm of Killearnan in Kildonan for 28 years, and has given a return from the annual accounts kept by his head-shepherd during the whole of that time; for the first eight years, however, the return of losses was not very accurately kept; the figures given are much lower than those of subsequent years, but, as they cannot be fully relied upon, it has been thought best to omit them and only give the 20 years that are quite correct. Mr. Hadwin rents of the Duke the arable farm of West Garty, near to Helmsdale and to his sheep-farm. Unlike most of his neighbours, he was able

Number of Sheep on Mr. Hadwin's Farms in October.

	1878.	1877.	1876.	1875.	1874.	1873.	1872.	1871.	1870.	1869.	1868.	1867.	1866.	1865.	1864.	1863.	1862.	1861.	1860.	1859.
Ewes	1027	1032	1040	1036	1031	1015	1024	1012	988	998	976	965	979	977	888	919	957	936	787	826
Gimmers ..	256	271	355	370	364	360	350	322	355	329	266	253	262	246	350	336	244	307	305	280
Wethers ..	269	543	695	663	630	665	620	659	695	737	370	360	311	361	339	348	230	355	314	655
Hoggs	845	581	729	820	837	820	817	827	778	775	744	702	712	674	752	717	705	517	666	655
Total ..	2397	2427	2819	2889	2862	2860	2811	2820	2716	2839	2356	2280	2264	2258	2329	2320	2136	2115	2072	2416

Number of Sheep Lost in the Twelve Months previous to Shearing Time.

	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.	1871.	1870.	1869.	1868.	1867.	1866.	1865.	1864.	1863.	1862.	1861.	1860.
Ewes	51	21	65	61	40	31	59	24	43	49	30	30	31	43	28	48	31	23	26	44
Gimmers ..	19	13	45	33	20	23	26	16	25	16	10	10	13	9	30	25	15	20	9	31
Wethers ..	10	23	111	49	49	35	127	24	26	31	17	7	13	8	11	10	1	13	11	7
Hoggs	121	173	131	86	93	89	127	64	87	64	60	61	50	64	110	101	68	113	78	17
Total ..	201	230	352	229	202	178	239	128	181	161	117	108	107	124	179	184	115	169	124	99
Loss per 1000	84	95	125	79	71	62	85	45	67	57	50	47	48	55	77	79	54	79	60	41
			91				63					55						62		

to winter all his sheep at home, and it was not till the autumn of 1878 that he ever had occasion to send any of them to be kept for him in the south.

When the sheep are drafted off in October, the lambs of that year are for the first time reckoned as hoggets. No lamb dying before that time is reckoned among the losses. To find the percentage of loss the number on the farm in October must be compared with the number lost in the 12 months preceding the shearing-time in June of the following year. The losses of course occur chiefly in the winter.

At West Garty there are 150 acres under the plough, and 30 acres of turnips are annually grown for the sheep. A failure of the crop last year, for the first time, made it necessary to send most of the wether hoggs to be wintered in the south. The land on this farm will, no doubt, compare favourably with the majority of farms where it is the rule, and not the exception, to send away a part of the stock for wintering; and one would expect the evidence of deterioration to be less marked here than elsewhere. During the 20 years comprised in the return there has been a great rise in the value of the sheep; if there were no counteracting influences we should naturally expect that, as sheep become more valuable, greater care would be taken, and that consequently the annual loss would be less; the contrary is, however, the case. If the 20 years are divided into four periods, it will be found that the average loss for the

5	years	ending	1879	was	91	per	1000.
5	„	„	1874	„	63	„	„
5	„	„	1869	„	55	„	„
5	„	„	1864	„	62	„	„

It will be seen that while the number of ewes kept does not vary much from year to year, the number of hoggs fluctuates greatly with the character of the previous winter and spring. The year 1877 appears to have been the worst lambing season of the whole period, but I learn from Mr. Hadwin that that of the current year was still worse. In spite of an expenditure of 700*l.* on hay, only 400 lambs were obtained, instead of the 800 that are expected in an average season.

This is the only return given in full for a long series of years, but it will be interesting to compare with it other returns given for shorter periods. Mr. Richard Rutherford, of Kildonan, returns the average loss upon his farm for the four years ending 1878 as 77 in the 1000. Mr. Blake gives a return for 3 years of the farm of Balnakiel, near Cape Wrath, which he occupied before he took charge of the home farm at Dunrobin. Balnakiel is almost surrounded by the sea, and Mr. Blake states that the

greater part of his loss was occasioned by the seaboard rocks, which extend for about 20 miles. He wintered the hoggs there very successfully on pasture, reserving the turnips for tups and dinmonts.

NUMBER of SHEEP at BALNAKIEL kept in OCTOBER to be WINTERED at HOME.

	1873.	1872.	1871.
Ewes	2067	2010	1943
Gimmers	597	549	476
Wethers	1884	1777	1682
Hoggs	770	687	699
Total	5318	5023	4800

NUMBER of SHEEP at BALNAKIEL sent away for WINTERING.

Hoggs	1026	1011	1011
Total of Sheep ..	6344	6034	5811

NUMBER of SHEEP lost in the TWELVE MONTHS previous to SHEARING-TIME.

	1873.	1872.	1871.
Ewes	67	60	60
Gimmers	18	20	20
Wethers	107	83	86
Hoggs	126	100	90
Total	318	263	256
Loss per 1000 ..	50	44	44

The average loss for the three years is thus only 46 per 1000, a very good result; from Mr. Hadwin's table, the years 1871, 1872, and 1873, are seen to have been favourable to sheep, but in his case the loss for those three years averages 62 per 1000. From the answers of those who give general estimates instead of definite returns of losses, I will select that given by Mr. Purvis, who says, "The loss for the twelve months is never under 5 per cent. over all, more generally 7½ per cent.; in very bad seasons 10, 15, 20, and even up to one-third of the whole number. In 1859–60, I lost nearly 1200 sheep, and out of 1400 ewes, had only 250 lambs; 1876–77 was a bad year; our general

loss was 15 per cent., and not half lambs. The death-rate appears to be increasing. Sheep are being softer bred, are being fed more artificially, and, owing to increased rents and expenses of all kinds, more sheep are being kept, and that on pastures getting yearly worse."

A few of the tenants have already shown themselves superior to class prejudices, and have welcomed the addition of some arable land to their holdings. The smaller reclamations that I have already mentioned as preceding the Shinness reclamations are all cultivated by the tenants, viz., 90 acres at Balone, by Mr. Crawford; 120 acres at Embo by Mr. Gordon; and 100 acres at Dalchork, by Mr. McDonald. There are a few other reclamations recently effected in the north-west, and one in the south-western part of the estate that it will be well to glance at briefly before I pass on to describe the larger operations now being carried on under Mr. George Greig at Kildonan.

Ribigill and Rhifail Reclamations.

The Ribigill farm, of 45,000 acres, on the west of Loch Loyal, is reckoned to carry 5000 sheep, at a rental of 1400*l.* It is rented by Mr. William Mitchell, a gentleman who adds to the intelligence and courtesy which prevail among these northern magnates a great amount of energy and enterprise. A few years ago there were only 30 acres of arable land upon the farm, but an arrangement was made by which 175 acres have been broken up and added to the arable land; and at the same time a compact set of farm-buildings has been put up. A pair of 8-horse engines were sent up from Leeds to do the work, the arrangement being that for the first 10 years Mr. Mitchell will pay 2½ per cent., and after that time 5 per cent. on the cost of the work, in addition to his former rent. The work was begun in the autumn of 1877, but was mostly done in the spring of 1878; the Sutherland plough was used with a simple stirrer attached. The land proved to be very full of big roots and stones; if this could have been foreseen, it would have been better to have employed engines of greater power. The farm is divided into 11 fields.

In field No. 1 there is much deep peat, and it would have been costly to form a solid headland for the engine to travel over this. One engine accordingly remained stationary upon a dry knoll near the centre of the west side, while the other engine worked round until half the field was ploughed. In field No. 2 there are 7 acres that have been hand-trenched, and 14 acres of old arable land is now in grass. The trenched land was full of stones, and cost 7*l.* per acre for trenching 12 to 15 inches deep in

1875; since then it has yielded excellent crops of turnips, oats, and grass. The crop of hay from the old land in 1878 was 35 cwt. per acre. The general appearance of this farm shows that it is admirably adapted for the growth of grass of good quality. The average rainfall of the district is under 40 inches.

Field No. 3 is partly old land and partly hand-trenched: on the former about 6 qrs. and on the latter 4 qrs. of oats were grown in 1878. No. 4 was steam-ploughed in 1876, and yielded a fair crop of oats in 1877; in 1878 it showed 5 acres of good yellow turnips, 5 acres of very good swedes, and 4 acres of potatoes—a good crop, but touched with blight upon the haulm.

No. 5 is old land. No. 6 was steam-ploughed in 1876 and 1877, partly limed, and then sown with turnips. The crop failed where there was no lime.

No. 7. After ploughing by steam, a poor crop of oats was obtained in 1877; and a very good crop of turnips in 1878 by applying 12 tons of horse-manure and 6 cwt. of artificials.

Nos. 8, 9, and 10 were ploughed, partially limed, and sown with oats, yielding a poor crop.

No. 11 is a field on the side of a steep slope; where the land was too steep for steam it was trenched by hand, it then got 4 cwt. of artificial manures; and 7 lbs. of rape-seed per acre were sown broadcast; the crop was uneven, but the result better than that from the oats sown in the similar fields adjoining.

The farm buildings are very substantially built of granite; adjoining them are 3 houses for married men, clipping-sheds, dipping-shed, and well-arranged sorting-yards for sheep. The cost of these reclamations has been 40*l.* per acre; a high amount, partly due to the fact that the engines were not powerful enough for their work; there was a great loss of time and increase of expense from frequent breakages, involving a long delay each time in getting new fittings sent up from Leeds.

During his occupation Mr. Mitchell has seen great changes in the circumstances of the farm. The green-land along the shore of Loch Loyal has gone back in condition since it was first taken from the small tenants, braxy is no longer a source of loss; it was caused by rich herbage, now there is none. The sheep are now leaner in spring than they used to be when the same number were kept. The "black" parts of the farm have been much improved by sheep-draining and burning. The loss on sheep, counting hoggs and all, is now greater than it used to be, and may average, one year with another, about 10 or 12 per cent. Five-and-twenty years ago men's wages were 1*s.* 6*d.* and women's, 6*d.* a day, now they are doubled. The

people are better clothed and fed, consume white bread and tea, and the men smoke instead of chew tobacco.

Sheep at that time could be wintered in Rosshire at $1\frac{3}{4}d.$, they now cost $4d.$ per week, and the owner of the sheep now pays for the keep of his shepherd.

Several farms in the north-western division of the county have recently had a portion of land broken up for cultivation, under the superintendence of Mr. John Crawford, the factor for this portion of the estate, but it is only at Ribigill that steam-power has been employed; in every other case the work has been done by hand-trenching to a depth of from 12 to 16 inches. At Skelpick, a farm of 22,000 acres, carrying 1700 sheep, 100 acres have been broken up by hand at a cost of $40l.$ per acre for trenching, clearing, draining and fencing. At Melness, a farm of 60,000 acres, rented together with Skelpick, by Mr. Donald McKay, and carrying from 5000 to 6000 sheep, the arable land has recently been increased from 25 acres to 70 acres. At Erribol, a farm of 45,000 acres, and 5000 to 6000 sheep, in the occupation of Mr. G. G. Clarke, there were 40 acres of arable land, but 70 acres have recently been added. At Rhifail, 35,000 acres, and 3500 sheep, there was no arable land under cultivation, but 200 acres are now being reclaimed. All these reclamation works have been commenced within the last five years. The last-mentioned of them I had the pleasure of inspecting in September 1878, in company with Mr. Crawford, who has had more than thirty years' experience of the reclamation of moor-land, and who most kindly afforded me every facility for a thorough examination of the work. From his residence, the House of Tongue, formerly the seat of the Lords of Reay, whose estates were purchased by the Sutherland family, we drove westward to Skelpick, obtaining a passing view of those reclamations, and then southwards down Strath Naver, once the most populous district in Sutherland, until the crofters were removed to the coast, and their holdings thrown into sheep-farms. On reaching Rhifail we were most hospitably received by Mr. Thomas Purvis, the tenant, who went with us from field to field of the reclaimed land. The six fields already done run in a straight line from south to north, along the face of a gentle slope having a western aspect. Fields Nos. 1 and 2 contain 14 acres each; then comes a considerable area of planted land surrounding the farm buildings, house, and garden; north of this is field No. 3, followed by Nos. 4, 5, and 6, each of them containing 21 acres; fields 7, 8, and 9 will be reclaimed further down the slope to the west of Nos. 4, 5, and 6. From 70 to 80 men have been employed, chiefly during the autumn, winter, and spring; they come mostly from the fishing villages along the northern coast,

and are good labourers. In summer they are away fishing. For their accommodation, five turf-huts or bothies have been erected; one of these bothies can be built for 15*l.* or 20*l.*, and will hold from 25 to 30 men. The whole of the land in the six fields has been drained 22 feet apart, mostly with stones, but some with pipes. The work has been most laborious, the subsoil being in some places hard gravel, but more commonly a grey till with big rocks in it, requiring to be broken with sledge-hammers; the average cost has been 7*s.* per chain for digging and filling. In a few spots of bog the drains have been sometimes cut 8 feet deep to reach a solid bottom. In order to dispose of the enormous number of stones raised in the trenching, the walls dividing the fields have been built of an extraordinary thickness, and deep hollows occurring in the line of road have been filled up with solid stone instead of earth. Fields Nos. 1 and 2 were trenched in 1872 by men paid by the day, at a cost of about 20*l.* per acre; and the land was left fallow for three years. The total cost, including the fencing and draining of these two fields, has been 40*l.* per acre, but the cost of the other fields will be rather less. The expense over the whole farm will be much more than was anticipated; the land has proved to be much more stony than it was expected to be, while the rate of wages has nearly doubled since the work was first taken in hand. The arrangement was that the tenant should begin to pay interest as soon as the first crop was put in, at the rate of 2½ per cent. for ten years, and 5 per cent. after that. The latter part of the arrangement may however be open to reconsideration, as the cost has far exceeded the estimate. A fair yield of oats was obtained as a first crop in 1875; it was dressed with superphosphate, dissolved bones, and guano. The land was sown with turnips in 1876, and again in 1877; both crops were fed off by sheep, the first was a poor but the second a very good crop. In 1878, there were about 47 acres in oats partly carried at the time of my visit, the crop being about 4 quarters per acre; the remaining 9 acres were in rape and seeds. The rape had come well after turnips, but was bad where grown after potatoes. These two fields will be laid down in permanent pasture. The rest of the new land will grow turnips and other crops for sheep. The remaining fields have been trenched by hand, each one year after the other; they have then been left fallow for two years. Long experience has shown that this is by far the most economical method of treatment; it is better in this work to lose time and the interest of the outlay for two years, than to attempt to force a crop before nature has prepared the soil for its growth. The soil is inverted to a depth of 14 inches, and stirred by the pick to a further depth of 6 inches.

The top spit of 6 inches is first thrown into the bottom of the trench, this is next buried by the soil obtained after the stones have been taken out of the next spit of 8 inches deep, the subsoil is then loosened and the stones are taken out of it to a further depth of 6 inches. The stones are carted off the surface by contract and the prices paid for this work will give some evidence of the enormous number of stones raised. It cost in No. 3, 6*l.* 10*s.*; in No. 4, 6*l.* 10*s.*; in No. 5, 6*l.*; and in No. 6, 3*l.* 10*s.* per acre. The trenching in each of these fields was done at one price, 2*s.* per imperial rod, or 16*l.* per acre.

It may be noticed that the cost of this single operation is as much per acre as the breaking up and clearing together cost on Achnanerain, the most stony of the Shinness farms. It is true that none of those farms were as uniformly stony as these Rhifail fields; but it is on stony land that one might have expected hand-labour to show to the best advantage, and if steam in its infancy could beat it, we may expect it will show to still greater advantage in its fuller development. No reclamations, however, can be effected in the present day so cheaply as those done formerly, when wages were only half as high as they are now. There is one very serious drawback to the successful cultivation of the land at Rhifail; no lime can be obtained in the district. The Erribol lime is brought by sea to Tongue, but to cart it thence a distance of 18 miles to Rhifail would add greatly to its cost, and consequently none as yet has been applied to the newly trenched land. A poor crop of oats was grown in 1878 on the No. 3 field, the other three fields were left fallow. A plot of ground near the farm-buildings was planted with gorse seven or eight years ago with excellent results. The drills were made 6 yards apart, and the plants are now very high and strong, affording excellent shelter and food for sheep in winter. The gorse thrives best on dry and gravelly soils.

The south-western division of the county contains very little land that can be rendered fit for cultivation. Mr. McIver, the Duke's factor for that district, states that the only reclamation worth reporting on is the improvement of about 100 acres at Clashmore, in the Stoir portion of the parish of Assynt, a mountainous and rocky district, very irregular in surface, and full of hillocks. Up to 1873 there was not a field in it exceeding 4 acres in extent. In that year the improvement of Clashmore was authorised by His Grace in order to employ the population of the parish of Stoir. The land has a southern aspect. The prevailing rock is red sandstone, but the surface is thickly strewn with fixed boulders of primitive rock. There is a thin soil on a surface of rock interspersed with moss; in some parts

the subsoil is clay and sand, in others the rock is soft and brittle, yielding to the pick; the general character of the soil is poor and barren. Trenching with pick and spade was tried by contract at prices varying from 1*s.* up to 2*s.* 6*d.* per rod of 6 square yards; but the men declined to contract, and it was carried on by day-wages to a depth of 12 to 15 inches. An enormous number of boulders were found below the surface. After using all the stones required for complete drainage and for building dykes to enclose the fields, large heaps or cairns are still left in all directions. The drains are from 3 to 5 feet deep, and were put near together to absorb the stones.

The cost of reclamation, draining, and fencing, has been about 33*l.* per acre, exclusive of 1500*l.* expended on offices and servants' houses. The land is still unlet; it is cropped on a five-course shift of 1st, oats; 2nd, turnips and potatoes; 3rd, bere and oats; 4th, young grass; 5th, pasture. The quality of the oats is reported to be good; and turnips and grass do well.

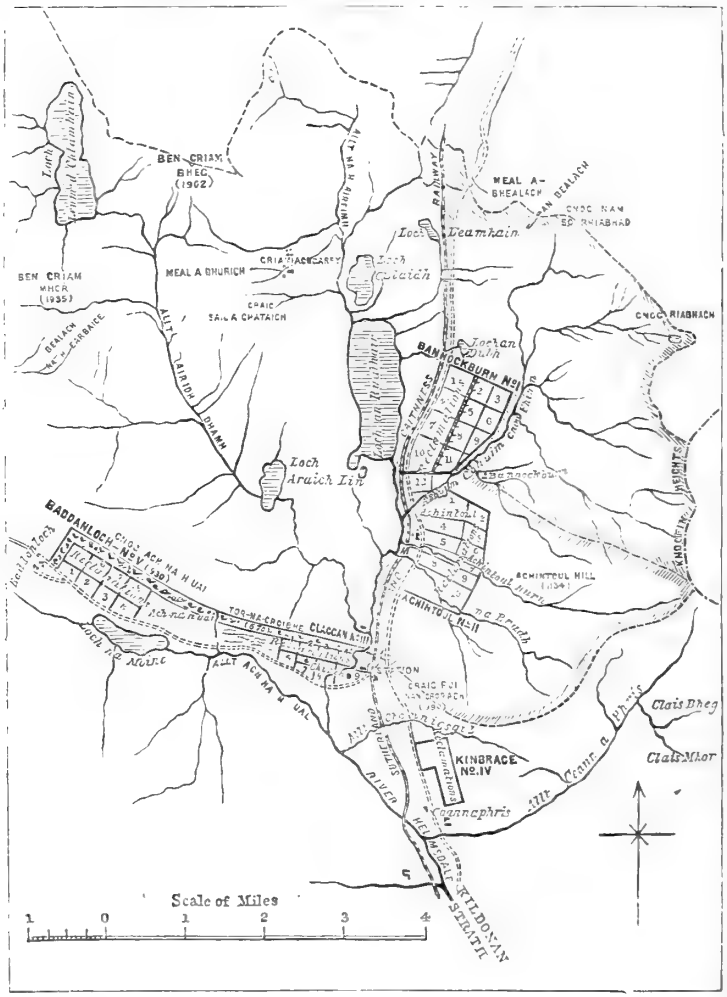
Kildonan Reclamations.

It will now be clearly seen that, while the problem of the application of steam-power has been vigorously worked out at the Shiuness farms, reclamations upon a smaller scale have been carried on at the same time by manual labour on several parts of the estate. After giving a fair trial, however, to each system, His Grace has such a decided preference for the use of steam-power, that he has undertaken the reclamation of still larger areas, placing the whole management of the undertaking in the hands of Mr. George Greig, and giving him authority to expend annually upon the work a sum not exceeding 10,000*l.* per annum. In the spring of 1877, Mr. Greig recommended the formation of an arable farm at Achintoul; his recommendation was approved of, and the work was at once commenced. Since then, four other sites in that neighbourhood have been selected, and work has begun upon them, giving a total area of 2000 acres, in five detached farms in the parish of Kildonan, situated in the vicinity of the Kinbrace Station on the Sutherland and Caithness Railway, about 30 miles north of Dunrobin.

The general features of the country may be gathered from the accompanying sketch-map (Fig. 11, p. 460). It will be seen that two streams—one coming from the north and the other from the west—join a little south of the station to form the Helmsdale river; parallel to the northern stream may be seen the railway and the high-road to Forsinard; another high-road runs parallel to the western stream.

Of the reclamations, Nos. I., II., and IV. abut upon the road that runs north, while Nos. III. and V. face the road to the west. In every case the slope of the land rises gradually from the road at its base to a moderate elevation on the face of a hill, which,

Fig. 11.—*Map showing the position of the Kildonan Reclamations.*



in most cases, continues to rise behind it to a much greater elevation.

It will be noticed, however, that Bannockburn Farm (No. I.) has a second stream upon its eastern boundary, and, the land

being highest midway between the streams, it has an eastern as well as a western aspect; its elevation above the sea varies from 430 to 565 feet.

Achintoul, or farm No. II., has a western aspect, and rises from 413 to 550 feet above the sea-level.

Claggan, No. III., faces the south, and rises from 360 to 650 feet.

Kinbrace, No. IV., has a western and a southern aspect, with an elevation of 430 to 650 feet.

Baddanloch, No. V., has the same aspect; its four lower fields rise from 425 to 550, and its four upper fields from 550 to 700 feet above the sea-level. The object in separating the farms, instead of making them contiguous like the Shinness farms, is that a sufficient outrun may be attached to each, probably in the proportion of 10 acres of enclosed outrun to each acre of reclaimed land. The extent of the outrun for farms, Nos. I. and II., is indicated on the map.

The altitude of the land varies considerably, and there can be little doubt that the low-lying fields will be best adapted for cultivation; it must be observed, however, that cultivation by spade-husbandry had previously been carried on in the district above the level of the highest land now to be reclaimed; and the marks of some of this cultivation can still be observed upon the hill-sides. About seventy years ago the crofters were removed, and their lands thrown into the one large sheep-farm of Kinbrace, comprising 30,000 acres, and reckoned to carry 6000 sheep. For many years it was in the occupation of Mr. William Houstoun, whose flocks were noted as being among the best in the county, a fine and healthy stock, doing credit to their feeding-ground. Two years ago Mr. Houstoun relinquished the farm, and his Grace retains it, with the intention of dividing it into smaller farms, to be worked in connection with arable land.

A full and accurate account is kept of all the expenses of these reclamations; and, to prevent any confusion of accounts, a fixed charge is made for the use of the engines, although they belong to the Duke. Mr. Greig agrees to pay 1*l.* per diem for each set of tackle as soon as it is delivered at the Kinbrace station, and the charge is to run on all the year round, whether the engines are at work or not, although they are kept idle all through the long winter. The superintendent of each set of tackle is required to give on a printed form a daily report of the length and breadth of the work done, the number and the names of the men employed, the time spent in actual work, in removing the tackle from one field to another, and the time lost from breakage or other causes. Three double-engine sets of tackle, two of fourteen-

horse, and one of eight-horse power, were hired in 1877; in 1878, a fourth, and more powerful set, of sixteen-horse power, was added to the others, and the hire of them up to September 1878 amounted to 1334*l.*, while the coal consumed, in addition to peat, from April 1877 to September 1878, was 806 tons. A certain quantity of this coal was consumed for domestic purposes in the manager's house. The number of hands employed upon the ground has varied from time to time, but the average for the whole time has been 115. Ten horses and twelve oxen are constantly employed, and are lodged in rough temporary stables. No permanent farm-buildings are to be erected until the reclamations have been effected, and some experience has been obtained of the description of farm-management best suited to the land. A smithy has been put up, as well as several small houses and huts for the accommodation of the workmen. Ten small wooden houses were bought for 5*l.* 5*s.* each; and as most of the others are of a similar character, it will be seen that no extravagant expense has been incurred in building; indeed the total outlay under this head up to the 31st of July, 1879, was only 939*l.* 12*s.* 2*d.* for buildings belonging to different farms, and 1300*l.* for portable buildings forming part of the reclamation plant, but not intended for permanent use on any of the farms. An iron three-roomed house, lent by the Duke, is not included in this outlay. It was occupied by Mr. A. Keir, who was resident-manager of the works at Achintoul and Bannockburn in 1878. A night or two in the iron house has given me pleasant opportunities, when the day's work was done, of hearing from Mr. Keir his experiences of these and of other reclamations in which he has borne a part.

A separate pay-sheet is kept on each farm, and in this the weekly wage paid to each man is divided and entered under the eight following heads or sections:—

1. Draining.
2. Trenching.
3. Clearing.
4. Fencing.
5. Building.
6. Liming.
7. Roads.
8. Farming.

Every month an abstract is made of the total expenditure upon each of the five farms, and is sent in to the Duke.

As a specimen, I may take the return for the month of June 1878. (See p. 463.)

Mr. Greig's report, in which he submitted a scheme of reclamation, is dated the 12th of April, 1877. No sooner was it approved than the work was commenced. The first pair of engines arrived before the end of the month, and were at once put to work at Achintoul, the No. II. farm. It would have been impossible on many moors to have thus commenced without

ABSTRACT of EXPENDITURE on KILDONAN RECLAMATIONS for the MONTH of JUNE, 1878.

		No.	£	s.	d.
Draining	Bannockburn ..	1	6	7	1
,, ...	Achintoul	2	100	18	10
,, ...	Claggan	3	6	13	11
,, ...	Kinbrace	4	16	4	1
,, ...	Baddanloch ..	5	30	10	2
Trenching	Bannockburn ..	1	77	14	4
,, ...	Achintoul	2	6	8	11
,, ...	Claggan	3	62	16	5
,, ...	Kinbrace	4	5	3	8
,, ...	Baddanloch ..	5	67	4	8
Clearing	Bannockburn ..	1	4	12	10
,, ...	Achintoul	2	65	11	0
,, ...	Claggan	3	6	13	11
,, ...	Baddanloch ..	5	0	10	2
Fencing	Bannockburn ..	1	83	19	4
,, ...	Achintoul	2	0	12	0
,, ...	Baddanloch ..	5	51	17	1
Building	Bannockburn ..	1	2	5	2
,, ...	Achintoul	2	4	13	0
,, ...	Claggan	3	4	10	9
,, ...	Kinbrace	4	7	5	9
,, ...	Baddanloch ..	5	12	4	5
Liming	Achintoul	2	406	17	10
Roads	Bannockburn ..	1	4	12	10
,, ...	Achintoul	2	20	0	6
,, ...	Claggan	3	1	17	9
,, ...	Baddanloch ..	5	104	18	3
Farming	Achintoul	2	17	14	6
Brora Works ..	..	..	100	0	0
Plant	..	..	178	5	9
		..	1459	4	11

previous preparation of the ground; but over a great part of this area the peat is not more than a foot in depth, and it rests upon a very open subsoil, varying from sand to gravel. Roadways were at first prepared by removing the peat and throwing in stones; but subsequent experience has shown that it is generally best to leave the natural surface unbroken, merely cutting a trench through the peat on each side in order to lay it dry, and then to lay upon this tough elastic bed the stones that are carted off the surface of the land that is to be broken up. Water for the engines was obtained by intercepting the surface-water at the base of the eastern hills, and carrying it, wherever it was required, in channels cut *in* but not *through* the peat. The surface of the land at Achintoul is not so level as that of the Shinness land, but, except by the sides of the streams, it is nowhere steep enough to impede cultivation. The three fields adjacent to the streams, viz. Nos. 1, 7, and 10, are not intended for arable land, but will be laid down for pasture. They embrace all the

low-lying and sheltered parts of the farm, and will afford shelter for ewes at lambing time, and for the sheep generally in the time of storms. The whole of the farm will be protected by a broad belt of trees on the north and east sides; consisting of birch, with Scotch, larch, and spruce firs. Its western side will be protected by the plantation that has been made along the eastern side of the railway, with a view to prevent the occurrence of the snow-drifts that have often blocked up the line in winter.

Along the eastern side of the farm there is a boundary-ditch intercepting the surface-water from the hills that would otherwise reach the reclaimed land. On the western side there is a Corrimony iron-wire fence along the road-side; a similar fence runs north and south through the centre of the farm, dividing the fields. There are 7 steel wires in these fences, 3 of No. 8 and 4 of No. 10 wire; the standards are of angle iron, 16 yards apart, with light iron droppers, 2 yards apart, between them. The straining and winding-posts, as well as the gate-posts, are all made from old service or contractors' rails, fastened into big stones with lava. The supports and small standards are also let into stones, and secured with a mixture of sand and sulphur. Mr. Greig states that the total cost of this fence at Achintoul, including labour and all the gates, does not exceed 10*d.* per yard. In October 1878 the materials for such a fence were offered for sale at the following rates:—

Specification of Corrimony Fencing Manufactured at the Brora Engineering Works.

Fence for Cattle or Sheep.

Height above the surface of the ground, 3 feet 9 inches, with 3 lines of No. 8 and 4 lines of No. 10 W. G. steel wire. Standards furnished with side stays to fit in stone 16 yards apart; and droppers to be fixed on the wires at intervals of about 6 feet between the standards. A double-acting winding pillar to be placed in the centre of each fence, or stretch of 400 yards or thereby. Straining pillars, with stays to be placed at distances, from the winding pillars of 200 yards, or thereby, or otherwise as may be necessary for the proper erection of the fence.

Price of Material for One Mile of Fencing.

			s.	d.		£	s.	d.
5	Double-acting winding pillars	at	16	0	..	4	0	0
5	Straining pillars	„	5	0	..	1	5	0
10	Stays for pillars	„	4	0	..	2	0	0
100	**T**-Iron Standards $1\frac{1}{2}'' \times 1\frac{1}{2}'' \times \frac{3}{16}''$	„	1	$2\frac{1}{2}$	..	6	0	10
100	Stays for standard $\frac{5}{8}''$ square	„	0	$10\frac{1}{2}$	..	4	7	6
770	Droppers $1'' \times$ No. 8 W. G.	„	0	$3\frac{1}{2}$	..	11	4	7
	Tying wire, No. 14 W. G.	„	12	0	..	0	12	0
	$1\frac{1}{4}$ cwt. sulphur batting cement	„	16	4	..	1	0	5
16	gallons black varnish	„	1	8	..	1	6	8
3	miles, No. 8 steel wire		..	..	..	8	6	0
4	miles, No. 10 „		..	..	..	8	2	0
						48	5	0

Price of Material for One Mile of Fencing—continued.

	£	*s.*	*d.*
Brought forward	48	5	0
1 field gate, 10 feet wide × 3 feet 9 inches high ..	1	9	0
1 „ 9 „ × „ „ ..	1	7	6
1 wicket 4 „ × „ „ ..	1	1	0
1 pair gate-posts fitted with crooks and slot hole for slip bolt	0	13	0
Total	52	15	6

Over the greater part of the farm the peat is only about 12 inches deep, resting upon a very porous soil. Deeper peat occurs in the three pasture fields, in the north-western corner of No. 4, and on the eastern side of No. 2. The whole work of trenching has been accomplished at Achintoul by steam-power alone, without leaving any corners, as at Shinness, to be ploughed by horses or trenched by hand. Very little blasting was required, as there were but few land-fast stones. The whole of the drains on this farm are laid with pipes. The minor drains are 4 feet, and the mains 4 feet 3 inches deep,—the contract prices being 5*s.* and 5*s.* 3*d.* per chain, respectively, for cutting, and 6*d.* for filling-in. The pipes are laid by day-work; and they lie well below the peat in solid ground. If at any spot a solid bottom is not reached at 4 feet, the men are instructed to cut the drain deeper until they reach it, and they are paid for the extra depth if it exceeds 6 feet. Good men, well used to draining, earn 3*s.* per diem at this work.

For the sake of appearance it has been thought necessary to drain and bring into cultivation the small patches of deeper peat; and in these places the work of cutting drains deep enough to lay pipes in the solid bottom has been a very laborious and expensive undertaking. The expense per acre of the whole reclamation would have been considerably less if these spots had been excluded from it. If such places had been merely surface-drained, and planted with alder or other trees, it would have been a great saving of expense, the landscape would have been improved, and the thinnings would have been of considerable value in a district where there are no indigenous woods.

When the land was first taken in hand, it was covered with heath about 12 inches high; this was burnt off before the ploughing commenced. By employing three engine-drivers besides the ploughman, and two watermen to each set of engines, the men were enabled to relieve one another, and the engines were often worked for 15 hours a day. The hardest and roughest part of the work was encountered at the commencement, in 1877. Unfortunately the season was unusually wet, and this greatly increased the difficulty of dealing with land that had undergone no previous preparation. My first visit to the ground was paid on the 26th of June, 1877; very heavy rain had fallen

on the 22nd and 24th of the month, filling the engine-tracks with water, and converting every hollow into a little quagmire into which the engines sank. For a day they seemed to make no progress at all; no sooner was one engine extricated from a hole than another came to grief elsewhere. Mr. Greig had spent the previous day, from 6 A.M. till 6 P.M., in going from one engine to another stuck fast in the bog, the men needing all the encouragement of the master's help and dogged resolution to keep them from abandoning their efforts in despair. I found ten men ladling mud from the deep hole in which one of the engines had sunk itself; others were fetching stones and birch saplings; the latter thrown in front of the wheels usually enable an engine to pull itself out of a hole, but in very soft ground it is often necessary to send a second engine to the rescue, or to pay out a helping rope from some engine that happens to be at work within a moderate distance. Good men will often be discouraged under such circumstances, and many of those who first offered themselves for work proved anything but well-trained workmen.

The work would have been rendered comparatively easy if proper roads had been first constructed; and, if sufficient accommodation had been provided for the workmen, a better class of hands would have been obtained. These provisions have been made before beginning work on the other farms at Kildonan; but to have waited for them in this instance would have caused the loss of a season.

With the exception of these troubles, which arose in great measure from the wetness of the season, there have been but few mechanical difficulties in the reclamations of Achintoul. The plough used was the same as that already described, except that the stirrer or subsoiler was rendered more effective by having a mould-board added to it: at first, a small short board was tried, but this was afterwards exchanged for a very large one that raised a considerable portion of the subsoil to the surface. The first furrow is cut from 20 to 24 inches wide, and about 7 inches deep; where the turf is shallow, the first furrow will often lift its whole thickness of 8 to 12 inches off the free subsoil and roll it over like a thick carpet; the second furrow turns up 12 inches of the subsoil, and where this is of a sandy nature it is spread irregularly over the whole surface of the first furrow. Where there are big stones in the land, a very large proportion of them are now brought to the surface by the huge turn-furrow of the subsoiler; but wherever a land-fast rock is touched, the man in charge of the rope merely pauses to put in a stick to indicate the spot, and pushes on with his work, leaving the rock to be extracted by hand-labour, or blasted by dynamite. Where there are many stones, the plough is often jerked from side to side, but never broken. In such places the huge turf-furrows are

often thrown up in wild confusion, but the ordinary result of the ploughing is that the surface is left covered with broad furrows of turf, laid obliquely with some approach to regularity, and divided by layers of sand of varying thickness; the total depth of soil moved is about 20 inches.

Occasionally, an acre or two of deeper peat occurs in the middle of a field, and here both the first and the second furrows are much deeper, and a total depth of 30 to 36 inches is attained. Care must be taken in these spots to break up or burn the black peat thus brought to the surface, or it will seriously interfere with the subsequent cultivation of the field.

The peat that is least fit for cultivation is best fitted for burning. Advantage has been taken of this fact in digging drains through the occasional pieces of deep peat that occur on these Kildonan farms. Where peat is cut by contract, in the ordinary way it costs 1*s.* 3*d.* to 1*s.* 6*d.* per cubic yard, measured after it is stacked dry. By marking out the line of the drains a year or two before the land is ploughed, the two top spits of the drain can be dug out and dried at the ordinary price of peat digging. Thus in No. 11 field of farm No. I., peats were dug in 1878 in the line of the drains for 1*s.* 4*d.* per cubic yard, and are now stacked on the spot ready for use by the engine. In 1879 peats were dug in the line of drains and stacked for 1*s.* to 1*s.* 3*d.* per cubic yard. The peat will be consumed by the engines, the whole cost is therefore charged to the trenching account. As there is no cost of carting, the peat thus obtained costs absolutely less than ordinary peat would do, while a considerable part of the draining work is thus done for nothing. There is a further advantage in this plan: the surface of the ground is laid dry, and becomes more consolidated, so that some subsidence takes place, and, when the drains are completed, they can with greater ease be cut down to the solid bottom.

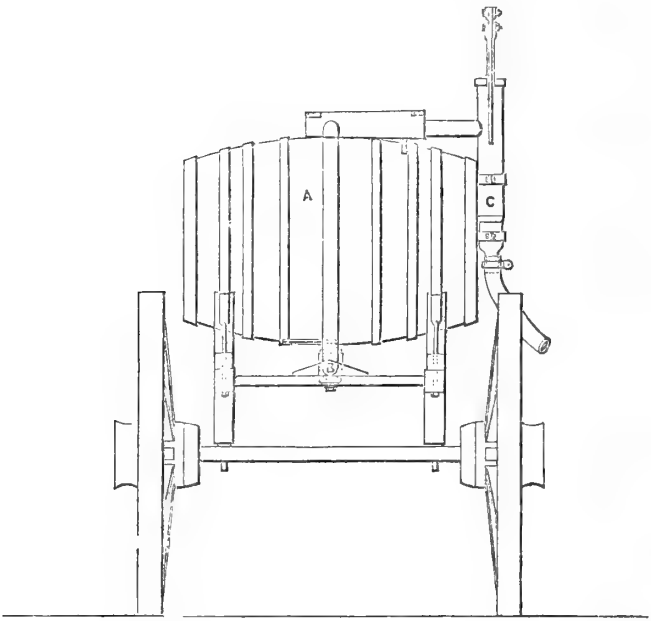
A pair of 14-horse engines will, on an average, burn about 15 cubic yards of fair peat; this, at 1*s.* 3*d.* per yard, will be 18*s.* 9*d.* When the peats have to be carted, we must add to this 6*s.*, making the total cost 1*l.* 4*s.* 9*d.* per diem.

Brora coals cost 12*s.* 6*d.* per ton, delivered at the Kinbrace station, and a pair of 14-horse engines will consume 3 tons per diem, at a cost of 1*l.* 17*s.* 6*d.*; to this must be added 4*s.* for carting, making the total cost of coals 2*l.* 1*s.* 6*d.* per diem—from 16*s.* 9*d.* to 1*l.* 2*s.* 9*d.* a day more than the peat. When it is added that peat possesses a decided advantage in burning without smoke or fouling the flues, it will be seen that wherever peat can be cut beforehand in the line of the drains, a very important advantage and saving may be obtained. Peat for burning should be cut in the months of May, June, and July.

It has been mentioned that much of the water for the engines

was obtained by conducting it from the hills in surface furrows to the spot where the engine was at work. Wherever this plan could not be adopted, it was necessary to cart it up from the main streams. The chief stream at Achintoul runs deep down between high banks, and great difficulty was at first experienced in getting up these banks, from the horse getting slung up by the cart tipping backwards. To meet this difficulty Mr. Greig has invented the Sutherland Water-cart (Figs. 12 and 13).

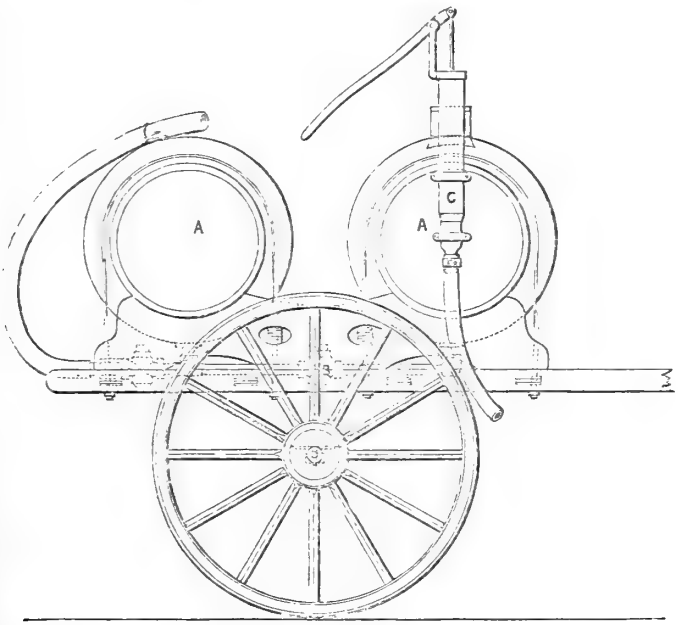
Fig. 12.—*End view of the Sutherland Water-cart.*



If a water-cart of the ordinary form, with its barrel placed longitudinally, is only half filled, in order to adapt its weight to the power of the horse, the result will be that in ascending a steep incline the water falls to the back end of the cart, and tends to lift the horse from the ground. Even if it is full, there is sufficient tendency in this direction to lessen the tractive force when the horse is on a gradient. In the new cart two barrels, AA, are placed across the frame, one before and one behind the axle of the carrying wheels. These two barrels are coupled by a pipe connected to the bottoms, having a cock, B, in the centre. A pump, C, with a hose, is fitted on to the first barrel, for the purpose of drawing the water from the stream. It will be seen by this arrangement that it is in the power of the carter to load his first barrel full, with his last barrel half

empty. If he has a very steep ascent to make he will load his first barrel only, and in this way a part of the weight of the water will be upon the horse's back, giving him a greater tractive force upon the gradient. As soon as the cart reaches the top of the ascent the cock is turned, letting water into the second barrel, and the weight on the horse's back is adjusted for level land. The barrels are made to hold half a ton of water in each. When empty, the weight of the whole is 9 cwt.

Fig. 13.—*Side view of the Sutherland Water-cart.*



Achintoul Farm.—No. 1 field (52 a.), is much of it deep peat. It was ploughed in June 1877 by a pair of 8-horse engines. As this field is intended for pasture, no stirrer or subsoiler was attached to the plough. Being content to take only a single furrow in depth, Mr. Greig avoided the trouble that would have been experienced in grappling with the fir-roots buried in the bog. Two ridges of sand cross this field, and it was proposed at one time to cover the whole of the deep peat with 3 inches of sand taken from these ridges, on sledges drawn by steam. This would, without doubt, have greatly improved the peat soil, but the expense would have been very great, and the project has been laid aside for a time. This field has not yet been drained, but some of the outfalls of the drains from Nos. 2 and 4 pass through it.

No. 2 (38 a. 2 r.), Sutherland-ploughed in 1877, and "disced" in 1878. The eastern side of this field is much deeper moss than the rest, running from 3 to 5 feet deep. Here some of the earliest drains were cut by a contract made in the expectation that solid ground would be reached at less than 4 feet deep. The pipes were laid 4 feet deep without reaching in some places the bottom of the peat; subsequent tillage with heavy implements shifted these pipes, and the drains became useless. Since then Mr. Greig has made it a part of the contract that in deep peat the drain should be carried 6 feet deep, without extra payment, 6 feet of peat being more easily cut than 4 feet of gravel. Wherever the peat is likely to vary much in depth, a plan has been adopted of first marking out parallel lines, a chain apart, over the field, then sending a man with an iron rod to sound the depth of the peat every chain-length along these lines. These soundings are marked down on a plan. A careful inspection of this plan enables the final lines for the drains to be laid down to the greatest advantage. Occasionally a deep pot-hole of small dimensions is thus discovered beneath the surface of a comparatively level field. Wherever it would be too expensive to cut a drain to the bottom of such a hole care is taken to carry the drains outside it. Any drain carried directly over such a hole would be sure to sink, and become useless. In some places of this sort the drain is excavated below its true level, and broken stones are thrown in until a solid foundation is obtained for the pipe at the proper level. In draining land of this description it is necessary to take special care that sludge and sand do not get into the pipes before the drain is properly finished and covered in. For this reason the whole length of the leader, or main drain, is first cut about 4 inches short of its full depth, and left open. The minor drains are then dug, and the pipes laid in them, beginning at the highest end of each. The men then clean out the leader to its full depth, and the superintendent sees the pipes laid in from top to bottom. In this way the sludge is driven before the pipes, instead of being allowed to run into them.

No. 3 (38 a. 2 r.). This was all Sutherland-ploughed in 1877; drained in 1878. In June and July 1878 about 30 acres were "disced." The "discer" was driven by 8-horse engines. For want of speed the work was not so well done as it might have been if more powerful engines had been employed. The land "disced" received 5 tons per acre of the Erriboll lime, was chain-harrowed by horses, top-dressed with 8 cwt. superphosphate and 4 cwt. kainite, and then drilled with 2 acres of swedes and 25 acres of Aberdeen yellow turnips. Though rather late sown, the turnips are growing well. The swedes will not have time to grow into a crop.

No. 4 (56 a.). The turf is thin over the greater part of this field, but there is a troublesome piece of about 15 acres of deep peat in its north-western corner, by the road-side.

Forty acres of this field were Sutherland-ploughed in 1877; "disced" and harrowed in the spring of 1878 by 8-horse engines. The land was next consolidated by sledges, limed, and chain-harrowed by oxen. Turnips were sown broadcast, with nearly 10 cwt. of bone-meal and dissolved bones per acre in July. Dry weather set in, and the crop was very poor. Sandy oats were sown in 1879, and were seeded down with a mixture of Italian and perennial rye-grass, alsike, and white and yellow clovers. Both oats and seeds were looking well in August.

Soil from this field was sent in January 1879 to Mr. T. Jamieson, of Aberdeen, who reported that it contained 38 per cent. of organic matter, but was deficient in all the most valuable mineral constituents except magnesia. Potash was only present in small quantity, and there were traces only of lime, sulphuric acid, and phosphoric acid. Only the western side of this field has been drained. The 15 acres of deep peat contain many big roots, especially in the corner next the road. From its position it was thought advisable to bring this land into cultivation, but it would have been much less expensive to plant it with trees. A contractor attempted to drain it at the usual price, but he soon threw up the job, and it cost fully 1*l.*, instead of 5*s.* per chain, to dig the drains. This part of the field has been sown this summer with rape and grass seeds.

No. 5 (39 a. 0 r. 16 p.). This was Sutherland-ploughed in June and July 1877; drained in the autumn of 1877, and spring of 1878. In April "disced," sledged, and sown with artificial manures, oats, and grass-seeds. The oats and grass both failed for want of lime. A dressing of slaked lime was given late in June, but it was too late to be of use that year. In 1879 grass was only to be found above the drains, where the subsoil thrown out had probably been beneficial, and at the roadside, where it is not improbable that the land at one time derived some advantage from the near proximity of the Achintoul Inn, now converted into the shooting lodge.

No. 6 (39 a. 3 r. 24 p.). In the autumn of 1877 the western side of this field for about 80 yards wide was broken up by the Sutherland plough in the form in which it came from Shinness, *i.e.* with a plain subsoiler or toothpick; the subsoil of this part of the field was only stirred and none of it brought to the surface. Afterwards a part of the field was ploughed with the implement in an improved though not in its latest form. A short mould-board was attached to the subsoil tine; this brought some of the sand and gravel to the top, and made good work where the peat was less than 18 inches deep; but

where the peat was deep and soft, the subsoiler sank into it and brought up huge furrows of soft black peat, throwing them up one over the other in the most irregular forms. In these soft spots the plough rolled and pitched about like a vessel ploughing the waves, but, like a good sea-boat, was never capsized. As a mere mechanical achievement it was wonderful to see how it rolled on its way, lifting thick rolls of peat from a depth of often fully 30 inches; but as such masses of peat are extremely difficult to deal with, and are most intractable if once they become dry, it was soon found to be necessary to remove the subsoiler altogether on soft peat, and the eastern side of the field was therefore only worked one furrow deep. The whole field was drained in the spring of 1878 at distances varying from one to four rods apart, but mostly at four rods; the pipes were all laid into the solid land, except about two chains in length of one drain, where dry turf was first thrown in and a board laid upon it; on this the pipes were then laid, with a board on each side to keep them in their places. The whole field was "disced" in July 1878. In August, five tons of lime per acre were carted on to it by horses, spread by shovels from the cart, and afterwards chain-harrowed. Turnips were sown in 1879, but late in the season. The crop in August was poor and stunted in growth; the best result on the new land being obtained on a part dressed with bone-meal. In one other spot of the field the turnips were growing vigorously, the explanation being that it was the site of an old croft.

No. 7 (45 a.). On the southern side of the stream a strip of land has been reserved as a green road for driving sheep through the farm to the hills. All the land on the northern side has been drained; a portion of green-land has not been broken up, but the rest was ploughed without the subsoiler in the autumn of 1877; "disced," harrowed, and dressed with Erriboll lime in 1878; in 1879 it was again "disced" and twice harrowed by steam, then sown with 8 lbs. of rape and the following grass-seeds per acre: 1 bushel Italian and 1 bushel English rye-grass, 4 lbs. rib grass, 4 lbs. of mixed seeds, and 4 lbs. each of yellow, white, and alsike clover. At the beginning of August the rape was nearly fit to feed off, and had every appearance of being the crop best fitted to the soil. This is one of the fields intended for pasture.

No. 8 (44 a. 3 r. 24 p.). This was Sutherland-ploughed in August and September 1877; drained in the summer of 1878, mostly two rods apart, but in some places one rod; "disced" in July and August 1878; limed with horse and ox-carts in August 1878, receiving 2½ tons of English and 2½ tons of Erriboll lime per acre, harrowed in by oxen. In 1879 Sandy oats were sown with 10 cwt. of a low-class superphosphate, 4 cwt. of kainite,

and 1 cwt. sulphate of ammonia. These are the best oats on the farm. Their appearance in August would have promised more than 5 quarters per acre if they had been growing on old land further south; but, allowing for the probable deficiency of yield out of the straw on this new land, it would be safer to estimate them at 4 quarters per acre. A part of the field on the south-eastern side is deep peat; here the oats are inferior to those on the rest of the field; such spots pull down the total yield per acre.

English lime is brought by sea to Helmsdale or to Wick, and thence by rail to the Kinbrace station. By taking whole cargoes of it the cost at Kinbrace is only 6*d.* per bushel; a very moderate price, making it, when the quality is considered, much cheaper than the lime brought from Erriboll. There is, on the other hand, some difficulty in dealing with 200 or 300 tons at a time. The plan adopted is to cart it into heaps of 40 to 60 tons and there slake it. When slaked, the lime is carted to the field and spread.

No. 9 (40 a. 1 r. 8 p.). The turf over the greater part of this field was from 12 to 18 inches deep, but on the eastern side it was fully 24 inches. It was ploughed from north to south in May 1877, partly with and partly without the stirrer; not being covered with the subsoil the turf became very dry; it was "disced" three or four times over in August 1878 by the 14-horse engines; but the result was not satisfactory, the surface in many places being left with many dry, loose, sponge-like pieces upon it. The succeeding severe winter improved the state of things, but more time is needed to bring the field into the condition that it would have had if it had been, in the first instance, either autumn-ploughed or covered with subsoil to protect it from the drying action of the summer sun. In 1877 the wet part of the field was drained 4 rods apart; intermediate drains were put in during 1878.

No. 10 (76 a.). The character of this field varies considerably; in the south-western corner the turf or moss is about two feet deep, but on the northern side of the stream there is a considerable area of peat, varying from 6 to 16 feet deep.

A considerable expense has been incurred in draining this land by day-work, with parallel drains 4 rods apart; and as an experiment a few of the deep drains, from 10 to 12 feet deep, have been put 8 rods apart. In digging the deep drains large roots of Scotch fir are found about 4 feet beneath the surface; after digging through about 6 feet more of peat, a distinct layer is found of heath and birch-wood, the seeds and small twigs being perfectly preserved in shape, although they must have been buried for hundreds of years. The upper ends of the drains towards the eastern end

of the field show that the peat thins out just where an edge of impervious blue clay crosses them a short distance below the ridge of the upper plateau; as soon as this edge of blue clay is cut, a large volume of water flows into the drain. The blue clay probably forms a basin that receives and collects the rain that falls upon the hill above, and the growth of peat below is due to the overflow from this basin. If this theory is correct, a channel running from north to south below the brow of the hill and emptying itself into the stream would cut off the water-supply from the peat-bog, and would, in course of time, render it dry without the expense of parallel drains. The drains have been well laid with large pipes; and as they all rest on a solid foundation, they will not be in danger of disturbance.

In 1877, when only a few of the drains had been cut, the land was ploughed without the stirrer from east to west; it was "disced" in 1878. No lime was given to it, but in 1879 it was dressed with the same artificial manures as the No. 8 field, and then sown with Sandy oats, with a few beans among them, and grass-seeds. The result is a total failure, but there is a marked difference where the drains were cut before the ploughing began; here the oats have made some growth, though the crop will be hardly worth cutting. Looking at the main part of this field, I should be tempted to say that it is altogether impossible to grow crops without lime on such land; but when one turns to the part first drained, one sees that if the water is once removed, the atmosphere will in time do that which the lime effects more rapidly.

To this fact is due the partial success obtained by the crofters in many districts where it was impossible for them to obtain lime. Where lime is scarce and dear, as it is at the reclamations described at Rhifail, it should certainly not be applied until a great part of the oxidation of the new land has been effected by the atmosphere alone; it should always be applied on new land several months before the crop is sown. It is a waste of seed to apply it on land that has once been water-logged and has not had time to become sweetened by natural or artificial agents. The soil of this field was sent to Mr. Jamieson in January 1879. He stated that there was in it 96·6 per cent. of organic matter containing much ammonia, though not in a state available for the nutrition of plants, a full quantity of magnesia, little potash, and mere traces of sulphuric acid, phosphoric acid, and lime. It was slightly acid in reaction.

No. 11 (25 a.) is the field lying on the west of the high-road, between it and the railway; it is intended to be in pasture. In 1877 it was ploughed without the stirrer; drained, "disced," sledged, and limed, in 1878. After harrowing, it was sown with grass-seeds and rape on September 2nd; they came

up well, but were killed by the frost. The land was sown again this spring, and the seeds looked well in August.

A series of experiments with different artificial manures has been tried by Mr. Greig upon a bed of pure peat thrown out from a cutting when the railway was formed. With every kind of manure and every kind of seed there was a total failure on every plot that had not received a dressing of lime. A similar failure occurred on every plot (though dressed with lime) where phosphates were absent. The best results were obtained upon a set of four plots dressed with different forms of phosphates, but each receiving a dressing at the rate of 120 bushels lime, 4 cwt. kainite, and 1 cwt. ammonia per acre. The phosphatic manures were different in each case, viz. 2 cwt. dissolved bones, 2 cwt. bone-meal, 4 cwt. superphosphate, and 4 cwt. ground coprolites. Each plot was sown with oats and different kinds of clovers and grasses.

When inspected early in August 1879, the difference between the different plots was not very great; the first two plots were the best. There was not much difference apparent between the superphosphate and the ground coprolites. It should be mentioned that the superphosphate was said to be of a low class, but I did not see the analysis of it.

A rough smithy and stable, and several small wooden buildings for workmen, have been put up at Achintoul, and one long iron-roofed store-house for manures and seeds. In the construction of this shed a good deal of accommodation has been obtained at a moderate cost. It is 100 feet long, 22 feet wide, and about 20 feet high in the centre of the roof. The roof is a semicircle of corrugated iron, resting upon iron pillars 11 feet high. Each of these pillars is a half-length, single-headed, flat-bottomed rail, purchased at the price of old iron. The spaces between these pillars are filled up with $\frac{3}{4}$-inch boards. There are two large sliding-doors, and a few small windows. The whole cost of this building was 220*l.*

The following are the expenses incurred at Achintoul, No. II., from the commencement of the operations to 31st July, 1879 :—

	£	*s.*	*d.*
Draining	2734	19	3
Trenching	2525	15	3
Clearing	1550	0	8
Fencing	731	0	11
Building	344	13	3
Liming	1613	4	11
Roads	207	0	1
Total	9706	14	4

The draining, fencing and liming of the land are not yet

completed. Trenching and clearing are the only important operations of which the full cost is already known. By dividing the cost of the trenching by 490, the number of acres that have been worked, the cost will be found to be 74*s.* per acre; but of these 490 acres, 340 were trenched deeply, and 150 only ploughed a single furrow deep.

Although the total amount expended is known, we cannot exactly ascertain the relative cost of the two operations, but it is probable that the 340 acres cost 5*l.* 13*s.*, and the 150 acres 4*l.* per acre. Not only is this result very satisfactory in itself, as showing that such work can be done by steam at a much smaller cost than by any other power, but there is this feature of special promise about it, viz. that a considerable part of the work was done by the implement in its less perfect form, and there is every reason to conclude that, as the cost per acre of the ploughing at Shinness steadily decreased on each of those four farms one after the other as they were taken in hand, so a further diminution may be expected as the work proceeds on this second group of farms in the Kildonan district. It will be noticed that the cost of clearing is also less per acre than it was upon any of the Shinness farms; but the difference here is less marked when the character of the land is taken into consideration.

The sandy nature of the soil would naturally make the crops grown upon it more liable than those at Shinness to be dried up in time of drought, but with deep cultivation there need be little fear on this account.

I have given the description of the No. II. Achintoul farm first, as it was the one first taken in hand; it will now be convenient to take the other farms in numerical order, as they occur upon the map, beginning with the most northerly, Bannockburn No. I.

Bannockburn Farm.—The name of this spot recalls a famous battle-field, in no way connected with it, and some 300 miles distant. It is singular that, though history has preserved no record of it, numerous cairns of stones, marking the graves of those who were slain, attest the fact that this, too, must at one time have been the site of one of those numerous fights, between the Sutherland and Caithness men, that were of such common occurrence along the border-line of the two counties.

On the eastern side of this land the peat is from 2 to 4 feet deep, but the greater part of it is covered with thin turf, not more than 12 inches deep, resting upon a poor sandy subsoil. The shepherds say that the sheep never throve here, but began to pine as soon as they were put upon it. The absence of large stones and of roots has made the cultivation of the land comparatively easy. In October 1877 the Sutherland plough commenced work in the No. 12 field, which adjoins the

Achintoul, No. II. farm. Two-thirds of the field were done before winter, and in the following April the field was finished. The engines then worked up the roadside, taking the fields in the following order:—

Nos. 12, 10, 7, the greater part of No. 4, and three-fourths of No. 1, the south end of No. 11, and the triangular field No. 9, were done the same year. The improved form of mould-board was put on to the subsoil-tine in the middle of No. 7, and has been employed in all the subsequent work.

The only steam work done on this farm in 1879 has been the "discing" of the fields, Nos. 12 and 10; the other six fields are left as they were last autumn, so far as human agency is concerned, but Nature has been silently doing a great work upon them, and the severe frosts of last winter have greatly loosened and shaken the turf; the benefit derived is not, however, always greatest where the land has been turned up longest, for the best effect of all is found in the No. 9 field, ploughed late in the autumn of 1878. Here the sun had no opportunity to dry the furrows, but the frost caught them when full of moisture, and has so thoroughly shaken them that, although they still retain their furrow-shape, a slight kick is sufficient to knock them to pieces, and no amount of subsequent drying in the sun could now convert them into peats fit for burning. The action of the large turn-furrow of the subsoiler is most valuable in spring and summer work; and although the sand or gravel that it brings up from below may need to be exposed for some time to the atmosphere before it will be fit for the growth of a crop, yet it prevents the turf from getting too much dried up, and so helps its disintegration. The No. 1 field contains only a few stones, but, while watching the plough at work in it, I saw a very large one fairly torn up and brought to the surface. It measured $4 \times 4 \times 2$ feet, and must have weighed about 2 tons. This is of course an exceptional size, but it is astonishing to see what huge stones the plough will commonly lift. When such a monster as this is caught by the tine, the common effect is that the plough is pulled up dead, and the engine is stopped. Great care has been taken to ensure that the strength of each part of the tackle is greater than the power employed. At such work as this, one naturally expects to find that the engines are quickly worn out or knocked to pieces; yet the first pair of fourteen-horse engines supplied to the Duke in 1871 are still at work, and in very good order.

No. 7 is the most stony field yet worked at Bannockburn; the stones are very numerous, but few of them are too large to be lifted into a cart. The method adopted for clearing this field was very good. At intervals of a chain apart the stones

were thrown on one side, so as to clear a space some 10 feet wide running from the road to the top of the field; up and down each of these spaces a traction-engine with broad wheels was driven, and a smooth firm surface was thus obtained for carting upon. The road-trustees were then glad to fetch away, at their own expense, a considerable quantity of stone for mending their roads, and the rest of the stones were removed by hired carts, at a cost of 5*s.* per day for a man with his pony and cart. The carter is allowed to graze his pony, but is only paid when actually at work.

Pipe-drains have been laid in the No. 6 field. In the fields, Nos. 2, 3, and 5, peats have been dug in the line of the drains, but as these will be burnt in the engines, the cost of digging them is charged to the trenching, and not to the draining account. It is intended to plant for shelter a strip of land running from north to south through the farm, and also two short strips that will divide the fields Nos. 4 and 7, and Nos. 10 and 12 respectively. No trees have as yet been planted, but the land has been fenced in. Wire fences will not be put up at Bannockburn, but the whole of the fences are of turf; a cheaper fence, affording much more shelter and protection from the wind, but not so permanent as wire. These sunk fences, as they are called, consist of a ditch and dyke. The top of the dyke, and its side next the ditch, are faced with large turves, 18 inches by 12, and the work commences with cutting out these turves along the line of the ditch. The following specification is given to the contractor, who undertakes to do the whole work at 6*d.* per lineal yard of fence.

"The ditch is to have a minimum depth of 2½ feet, with a breadth at the bottom of 1½ foot, and sloped outside to a breadth of 6 feet; the inside of the ditch to have 10 inches of batter and 9 inches scarpment at the foot of the dyke. The turf for the dyke to be cut 18 by 12 inches, and built 2 feet 6 inches in height without the cope, which will be 4 inches thick, and project 2 inches to the front. Every course as laid to be well packed with the feet, and every second course as a through-band, and all joints broken. The loose earth at the back will be dressed to a uniform slope, and the entire work completed to the satisfaction of the Inspector for the time being."

When these fences are well made in the autumn or early spring, the turves grow together and the dyke-face becomes solid. It is impossible to make a good fence late in the spring or in the summer; the turves become dried, the vegetation is killed, and there is no cohesion in the parts of the dyke.

A well-made fence of this sort is sufficient to keep in sheep, but not Highland cattle.

In carrying out reclamations by steam-power, it is best to put up at first only the outside fences of each farm; as other fences would interfere with the movements of the tackle, they should not be erected until the land is reclaimed.

For the accommodation of twenty of the workmen a wooden bothy has been erected, and a temporary stable for two horses of the same material has been put up in the No. 7 field.

Bannockburn is intended to be divided into four small holdings, each containing from 80 to 120 acres of reclaimed land, with about 1000 acres of out-run attached to it. A very compact block of buildings has been designed for each of these farms, to be placed near the high road; one set of these buildings is already erected. It consists of a six-roomed cottage, with a small covered yard at the back, connecting it with a stable and byre, with loft and small granary over them. The whole of the building, with the exception of the doors and window-frames, is of concrete and iron. The roof of the covered yard, stable, and byre is of corrugated iron, carried on a very strongly trussed frame, constructed out of old contractors' rails and old steam-plough ropes; all the concrete floors, and the roof of the dwelling-house, are carried upon old iron rails. The stairs in the cottage are of concrete; stone and sand for concrete are obtained on the spot. One part of Portland cement is used with seven parts of stone; the outside coat will be one part Portland cement to three of sand. One of Blake's stone-crushers is employed to break up stones obtained in the reclamations to a size suitable for the concrete. Iron and Portland cement are the only materials that have to be imported. The building is quickly erected, and bricklayers, slaters, and carpenters, are not required, which is a very great advantage at a spot far removed from any town, and where no buildings suitable for the accommodation of artisans are to be found within many miles of the site. It is expected that the labour on these small farms will be chiefly done by the tenant and his family. The Duke hopes to see an increase in the population, and wishes the land to support men as well as sheep. Tenants in such a position, far removed from market-towns, must be greatly dependent on one another. If they are good neighbours they may assist each other greatly in their work, and by clubbing together for the purchase of implements and other necessaries. The amount expended at Bannockburn up to the 31st of July, 1879, has been

	£	*s.*	*d.*
Draining	224	0	5
Trenching	1418	5	5
Clearing	306	2	11
Fencing	273	10	9
Building	520	1	1
Roads	18	0	10
Total	£2760	1	5

Claggan Farm, No. III.—This farm is well situated, very near the railway station, with a good southern aspect. It will be sheltered from the north by a broad belt of plantation running along the face of the hill, and extending from this to the No. V. farm. The planting has been finished, but several years must elapse before much benefit is derived from it. The whole of the farm was Sutherland-ploughed in 1877 and 1878, with the small mould-board upon the subsoil tine. All the stones have been raised to the surface ready for carting away. Most of the turf on this farm is shallow, and it is not expected that much draining will be needed, except near the road where the peat is deeper.

No work has been done on this farm since the autumn of 1878, and none of the land has been "disced." Being left in the rough furrow, the frost of last winter penetrated well into the turf. The outlay upon this land up to the 31st of July, 1879, was

	£	*s.*	*d.*
Draining	208	4	11
Trenching	1329	10	2
Clearing	171	10	2
Building	18	16	10
Roads	7	2	8
Total	£1735	4	9

The only operation that is completed is the trenching of 250 acres, at a cost of 5*l.* 6*s.* 4*d.* per acre.

Kinbrace Farm, No. IV.—On this farm very little work has been done. One field has been drained, and four fields have been partially fenced. The expenditure to the 31st of July, 1879, was

	£	*s.*	*d.*
Draining	324	14	4
Trenching	92	7	4
Fencing	103	4	2
Building	37	17	10
Total	£558	3	8

In driving along the road from the No. III. to the No. V. farm, when about halfway, one passes some good grass-land on both sides of the road, a good example of the benefit derived from the cultivation of the crofters fifty years ago. This result is probably due to cultivation without the aid of lime, for there is little chance of lime having been brought into this district before it was opened up by the railway. A little further on may be found two surviving cabins of the old type described by Mr. Loch; one of them is occupied by an octogenarian ex-policeman from Edinburgh, whose wish has been gratified that he might return to the home of his boyhood; the other is tenanted

by two brothers, who, though shut up to one another's society, are said to pass whole months without exchanging a word.

Baddanloch Farm, No. V.—It will be seen from the map (Fig. 11, p. 460) that this farm has a southern aspect, and will be sheltered by the new plantation on the north and west. No work has been done in the four upper fields. A catch-water ditch and sunk fence divide them from the four lower fields.

Draining is the only work that has been done in the No. 1 field (41 a. 1 r. 8 p.). There is thin turf at the upper part, but deeper peat at the bottom of the field. Drains at a chain apart run from the top to the bottom of the field, and short intermediate drains are cut in the lower ground a rod apart in the deep peat and two rods apart in the intermediate land. Many stones are found, and an iron pan occurs about 30 inches below the surface. Along the top of the peat a vein of blue clay is found, and just above it the sand and gravel, instead of being reddish-brown as usual, are of a bluish-grey colour, showing that they have been under water. The growth of peat below is probably due to the overflow of the water collected in the basin of the impervious stratum above it.

No. 2 field (40 acres). The Sutherland plough commenced work in this field in May 1878. It continued its work in the No. 3 field (35 acres), and finished the No. 4 field (34 acres) in the following August. The winter frost has had most effect on the fields last ploughed.

A contractor has engaged to clear these three fields of stones for the sum of 200*l.* The No. 2 and No. 3 fields will only yield stones enough for the construction of an excellent stone dyke, now being erected along the roadside, at a cost of 1*s.* per lineal yard for labour. No. 4 contains a much greater number of stones. The surplus of these will be used in forming two other stone dykes, running through the middle of it and crossing it at right angles. When this is done, the whole field, with its four divisions, will, like a huge stell, afford excellent shelter for sheep during winter storms. The expenses on Baddanloch to the 31st of July, 1879, were

	£	*s.*	*d.*
Draining	365	8	5
Trenching	959	14	7
Clearing	51	15	11
Fencing	90	6	7
Building	18	3	2
Roads	4	4	3
Total	£1489	12	11

It will be noticed that the amount charged for trenching upon this farm is unusually high, amounting to about 9*l.* per acre.

This is partly due to the extraordinary number of stones in the No. 4 field, and partly to an imperfection in the subdivision of the accounts, by which the whole cost of a new steel-wire rope has been placed to the debit of this farm, as well as an unusually heavy charge for repairs done to the engine and plough. Only a percentage of the cost of the rope and the repairs should have been charged against these three fields. The following are the detailed items of the account:—

	£	*s.*	*d.*
Wages	452	11	6
Railway account	38	13	2
Straw, hay, oats, and bran	73	6	2
Brora Works' account for hire and repair of engines and plough	212	12	8
New ropes	127	17	0
Coals	7	6	0
Timber	15	4	10
Sundries	32	3	3
Total	£959	14	7

The returns of the expenses upon each of these five farms have been extracted from a full account given to me of all the cash received from the Duke.

The expenditure is first divided into three separate accounts: the reclamation work, the arable farm, and the sheep farm. These are kept quite distinct from one another, and each of them is debited or credited with any benefit derived by one from the other.

The Duke has purchased from Mr. Houston the sheep stock on the farm, and Mr. Greig has undertaken the management of them. There is nothing as yet connected with the sheep farm that calls for remark, except the purchase of a small cargo of Dutch hay, which has been put into small stacks on different parts of the farm, so that it shall be at hand for feeding the sheep if required next winter. David, the head shepherd, highly approves of this innovation, and says the hay is like Noah's ark, a wise provision for the future. The ricks were temporarily covered with turves until rushes could be procured for thatching them. Hay is without doubt one of the best winter foods for sheep; but it is expensive, and bulky to carry. By the time it is stacked and thatched it costs fully 5*l.* per ton. For a little more money a much more concentrated food of greater manurial value might be obtained; and it is well worth considering whether by judicious management some other food could not be used with probably more benefit to the sheep, and certainly greater benefit to the land.

I will now recapitulate the gross expenditure on the reclama-

tion of each farm, and add certain other expenses that have been incurred for their common benefit.

Expended previous to 31st July, 1879.

	£	*s.*	*d.*
On the Reclamation of Bannockburn, No. 1 ..	2,760	1	5
„ Achintoul, No. 2 ..	9,706	14	4
„ Claggan, No. 3 ..	1,735	4	9
„ Kinbrace, No. 4 ..	558	3	8
„ Baddanloch, No. 5 ..	1,489	12	11
Plant Account	2,996	10	9
Total expended on Reclamation ..	£19,246	7	10
Sheep Account	623	17	4
Arable Farm Account	2,616	6	2
Total	£22,486	11	4

The large item of plant account comprises the working horses and oxen, tools and implements, and various temporary buildings erected for the reclamations, but not fitted to be of permanent use after the farms have been brought into cultivation.

Ten horses are kept. They cost with their harness 550*l.* In addition to these about twenty hired ponies have been employed. Twelve working oxen have cost 320*l.* Four pairs of these came from Norway. They are of great use in carting and harrowing, but are inferior as workers to the two pairs of native oxen. These latter are found to be much better than horses for working upon soft ground. They are of great strength and patience, and are not apt to strain themselves as horses will at a dead pull. Carts, sledges, barrows, and various tools—such as spades, shovels, and picks—have cost about 700*l.* The small tools have been a great expense, from the carelessness of the workmen. The labourers have been continually changing, and there is reason to fear that many tools have been taken away. 100*l.* has been spent on furnishing the iron house. About 1300*l.* has been spent on temporary buildings, reckoned as part of the plant and not counted as buildings belonging to any particular farm. A part of the large item of "arable farm account" has been expended on a great store of artificial manures and seeds not yet sown; another part has gone for farm implements; and the rest has been laid out on the land at Achintoul. This is the least satisfactory part of the account; for it would no doubt have been better to wait at Achintoul, as they are now doing upon the other farms, until atmospheric influences have done their full work in preparing the land for the growth of crops. There is often good reason for "the agricultural pace." If we do not leave time for Nature to do her work—by sunshine, frost, and

rain—we often spend our toil and strength for nought. Although the manures applied have not yet given a return proportionate to their cost, it must be remembered that they are chiefly phosphates, slow in their action, and not liable to be washed out of the soil.

In describing what has been done on this group of farms in Kildonan, I have not hesitated to point out from time to time all that appears questionable or defective in management; feeling sure that no amount of honest criticism will lessen the credit due to Mr. Greig for his skilfully planned and ably executed scheme of operations.

It is easy to be wise after the event. It is not so easy to prosecute a great work like this, economically and efficiently, with labourers untrained to steady work, and in a country so thinly populated that it presents many of the difficulties usually encountered only by a colonist.

My thanks are especially due to Mr. Greig for the cordiality with which he has carried out the wish of the Duke of Sutherland, that full access should be afforded me to all records of expenditure, and for the frankness with which he has supplemented those accounts and given further information.

Conclusion.

The following Table (p. 485) shows in a condensed form the extent and the cost of the reclamation works recently completed by the Duke of Sutherland. When we add to this the manual work still in progress on 200 acres at Rhifail and 217 acres at Bighouse, and the steam work on 2000 acres in the five farms at Kinbrace, we see that an amount of capital has been expended upon these undertakings that must of necessity produce a great effect upon the county.

There are probably many agricultural readers who have shared with me in the first impression produced by brief notices that have appeared from time to time of the work done in Sutherland—a suspicion that, after all, it was merely the expensive amusement of a wealthy proprietor, justified chiefly on the ground that a nobleman may as well create farms out of moorland for his pleasure as keep an expensive stud of racers. This report will fail in its aim if it does not remove such an impression. As an effort to arrest the gradual exhaustion of the soil, and the consequent impoverishment of the estate, these reclamation works are well worthy the attention of landed proprietors. The benefit which they may confer upon the tenants of sheep farms has been already shown during the unusual severity

Extent and Cost of Reclamations recently completed in Sutherland.

Date of Reclamation.	Farms, &c.	Acres Arable.	Total Expenditure.		Reclamation.		Buildings.		Farming.	
			£	Per Acre.	£	Per Acre.	£	Per Acre.	£	Per Acre.
				£ s. d.		£ s. d.		£ s. d.		£ s. d.
1873–5	Colaboll	345	23,080	66 18 0	16,498	47 16 5	2,529	7 6 7	4,053	11 15 0
1874–6	Achnanerain	330	19,576	59 6 5	14,052	42 11 7	2,187	6 12 7	3,337	10 2 3
1875–7	Achadaphris	475	29,520	62 2 11	16,404	34 10 8	3,105	6 10 9	10,011	21 1 6
1875–7	Lubvrec	405	30,886	76 5 3	14,041	40 2 2	2,946	7 5 6	11,226	28 17 7
1876–8	West Shinness	217	8,625	39 15 0	6,879	31 14 0	..	..	1,746	8 1 0
1876–7	Achnanerain Lots	37	1,812	48 19 6	932	25 3 10	651	17 11 11	229	6 3 9
1875–7	Achadaphris Lots	20	2,006	100 6 0	768	38 8 0	1,084	54 4 0	154	7 14 0
1873–7	Dalchork	103	3,835	37 4 8	3,393	32 18 10	..	..	442	4 5 10
1872–5	Balloan Lairg	90	5,408	60 1 9	3,414	37 18 8	1,300	14 8 10	694	7 14 3
1875–7	Embo Dornoch	137	3,934	27 19 8	3,934	27 19 8				
1877–9	Ribigill	152	6,080	40 0 0	6,080	40 0 0				
1873–7	Clashmore Assynt	92	4,964	53 19 3	3,131	34 0 8	1,833	19 19 7	All done by hand labour.	
1871–6	Melness	70	2,030	29 0 0	2,030	29 0 0	..	..		
1872–7	Erriboll	70	2,800	40 0 0	800	40 0 0	..	..		
1872–8	Skelpick	100	4,000	40 0 0	4,000	40 0 0	..	..		
	Total Expended	..	£148,556							

of the past winter, when in several instances the newly reclaimed land proved to be the salvation of the flocks; and in other cases the want of food-producing arable land has been the cause of very heavy losses during the long-continued storms.

The question of cost is of primary importance to the tenant. The present rate of $2\frac{1}{2}$ per cent. for 10 years and 5 per cent. after that time, charged upon the outlay, must be considered very low when it is recollected that $6\frac{1}{2}$ per cent. is the normal rate prescribed by the Land Improvement Companies for the redemption in 28 or 30 years of the capital expended upon the improvement of land. Yet even at these low rates an outlay of 30*l.* per acre will make the rent of the land 15*s.* per acre for the first 10 years, and 30*s.* per acre subsequently.

Since every increase of outlay must involve an increase of rent, it is of the highest importance to reduce it to a minimum. If it had not been possible in subsequent undertakings to effect a very great reduction on the enormous outlay incurred in the first reclamations by steam-power at Shinness, such work could then have been undertaken only by those who are content to give up the hope of a direct pecuniary return, and to look for their sole reward to the good accomplished for others, and the indirect advantages of their public spirit.

It is difficult to estimate the full extent of the benefit conferred upon the county by what has been done. The distribution of large sums in wages has added greatly to the material comfort of the labourers. At the same time, habits of steady industry are gradually being acquired by a population described of old as "hardy but not industrious"; while the example of these reclamations and the experience gained upon them is also stimulating the crofters to bring into cultivation numberless small patches of eligible ground close to their own homes. In considering the benefit conferred upon the labourers the question may naturally be asked, Would it not have been better for them if a still greater proportion of the expenditure had been spent in wages, and manual labour alone had been employed as it is on the reclamations in Galway, described last year in this Journal? There hand labour was employed as much as possible, and comparatively little was left to be accomplished by the horse and ox; here we find steam the chief power employed. In each case the agency adopted is that best suited to the locality. In Connemara, the presence of a large population eager to work at wages far below the average paid elsewhere in the British Isles makes manual labour best, both on economical and social grounds. In the almost uninhabited glens and moors of Sutherland, steam is the only power that could have changed the surface of the land to an appreciable extent in so short a time. Even with its aid

it has been difficult to obtain and house all the men and horses needed to supplement its work. The manual labour required has been fully equal to the local supply. Had it been greater, the consequent rise in wages might have been so sudden and so great as to have had a demoralising instead of a beneficial effect upon the population.

As it is, these costly works, following as they do upon other great improvements carried out by the present owner and his father, have already contributed to the social and domestic welfare of a people who, from the absence of trade and manufactures, and from the mineral and agricultural poverty of the land, must ever be largely dependent for their prosperity upon the action of the proprietor. The stone-built and tiled or slated cottages which have everywhere replaced, or are rapidly replacing, the turf hovels described by Mr. Loch, contrast most favourably at the present time with the houses of the peasantry in counties more favoured by nature, and prove that the Duke and his predecessors have nobly met the great responsibilities and duties of their position.

XVII.—*The Advantage of converting Cold Clay Arable Land into Permanent Pasture, and the best Method of doing it.* By W. T. Carrington, of Croxden Abbey, Uttoxeter.

A subject of pressing importance at the present time to many landowners and occupiers is how to deal with poor clay arable land in a damp climate, so as to render it what it at present is not,—profitable for occupation.

Most occupiers of farms consisting largely of such land find their capital yearly decreasing, and in the numerous cases in which such farms become vacant, the owners find great difficulty in reletting them. It is undoubtedly true that from the operation of a variety of causes,—especially the low price of corn, due to an immense foreign import, the increased cost of both horse and manual labour, and a series of seasons specially unfavourable for the yield of corn and for the cultivation of wet clay soils,—much of the clay land in those parts of England, where the climate does not favour a heavy yield of corn, has not paid the expenses of cultivation.* With the exception of the character of the seasons (in which some improvement may be hoped for), the other causes may be expected to

* Since this paper was written, the season of 1879 has proved the most disastrous of the series to the occupiers of cold clay arable farms.

continue in operation. It is therefore important for those who have to deal with such land carefully to consider their position, and, if possible, to alter their system of farming so as to avoid loss.

An elaborate system of book-keeping is scarcely applicable to practical farming, but if occupiers would pay more attention to the details of the actual cost of cultivation, and the actual value of the crops from separate fields in arable culture, they would in many cases find that a heavy yearly loss results from the cultivation of certain fields. The conversion of all such fields into permanent pasture, in which condition only a small annual outlay in labour is required, is therefore desirable.

Mr. Caird, in his admirable article upon British Agriculture, in the 'Royal Agricultural Society's Journal,' vol. xiv. part 2, 1878, states with truth, that "a rich loam which yields a ton of wheat to the acre is less costly in labour than poor clay which yields little more than half that weight." As the rich loam also requires a smaller outlay in manures, and in the growth of root crops, the disproportion between the cost of production and the annual value of the produce on the poor strong land is still greater. It is therefore perfectly obvious that whilst rich and easily worked arable land may pay a good rent, and give a fair profit to the occupier, poor clay may, at the same time, even if well farmed and rent free, be farmed as arable at an annual loss. The Right Honourable the Speaker of the House of Commons recently spoke pointedly on this subject. On the farm in his own occupation, of 670 acres, there are some 60 acres of strong land under tillage. Concerning this portion of his farm he said, "My profits for the last five or six years have been very much affected by the small returns from these 60 acres of heavy land. I find that three out of four of the seasons are of such a character that the returns from that land are very small; therefore I propose at once to lay down all that land in pasture. As I shall look forward to raise much more meat and less corn, I think the result must be of a profitable character."

If this experience be correct as regards the comparatively dry climate of the county in which his farm is situated, it applies with much greater force in the damper districts of England.

Mr. James Howard, whose trade interests would certainly not lead him to regard with special favour the extensive conversion of arable into pasture, in a recent letter to the 'Times,' on the depression in agriculture, remarks, "With the low prices for grain which may be expected to rule in the future, not a few landowners would do well to arrange with their tenants to bear a part of the expense of sowing down in grass a certain portion

of arable land each year. Judiciously carried out, especially upon poor heavy land expensive to till, the value of the estate would be enhanced, and the position of the tenant improved."

Some political economists who are quite ignorant of practical agriculture, although they think themselves fully qualified to teach the farmers their business, and some intelligent and successful farmers, like Mr. Mechi, whose experience has been in a climate suited to the growth of corn, and with land which, if clay, is fairly level, free from timber, and capable of steam tillage, have deplored, in the public interest, the increase of permanent pasture which our agricultural returns show to be growing in England.

Farmers, however, are not bound to keep their land in tillage or conduct their business at a loss any more than any other trading class. I am no advocate for the conversion into pasture of arable land which is readily capable of profitable cultivation. Where, however, the conditions are mostly adverse to tillage, where the climate is cold and damp, the soil stiff and unworkable, the position hilly, the inclosures small and irregular, hedgerow timber or ground-game abundant; in those cases where some if not all of these conditions apply, no reduction of rent will wholly meet the difficulty. The land being unprofitable to plough should be laid down to grass, when, if the produce be but small, the cost of labour may be reduced to a minimum, and actual loss thus be avoided. In order better to illustrate my point, I will quote the actual facts with regard to a farm where the conversion of poor unprofitable arable land into very useful pasture has been carried out under my own observation.

Twenty-three years ago a friend of mine entered upon a farm of 240 acres, on a large estate. One-half of it was then in turf of fair quality, but in rather poor condition; the remainder was arable, 80 acres on one side of the farm being poor strong marl, the fields hilly, with a northern aspect, the remaining 40 acres being more workable, and sloping to the south, though with rather a shallow soil.

The previous tenant of the farm had been losing money, and the offgoing crop of wheat was, I believe, about 2 qrs. per acre. The new tenant, convinced after the first year's experience of the unprofitable nature of much of the arable land, commenced the process of permanently seeding the stiffest and most hilly fields. The clover and grass seeds were generally sown with a corn crop, but twenty acres were sown without corn, and with rape, eaten on the land when grown up, with sheep and young cattle. Each year one or more fields were permanently seeded, the young seeds being top-dressed periodically, some-

times with bones, but more often with 1 to 1½ cwt. per acre of nitrate of soda and 3 cwts. of good mineral superphosphate, or 2 to 3 cwts. of Peruvian guano, or 10 tons per acre of farm dung. The young seeds were carefully grazed with a mixed stock of dairy cattle, young cattle, and sheep, care being taken to avoid damage by the treading of heavy stock in very wet weather, and by too close grazing by sheep; and, on the other hand, by keeping the seeds well grazed down in the early summer to prevent the seed stalks from getting ahead, and thus checking the growth of fresh grass.

Decorticated cotton-cake was freely given to the stock grazing on this turf, and after the seeds were down three years, sheep were kept on them through the winter months, a few roots being carted to them, and cake supplied in troughs moved about the poorer portions of the land. The process of seeding has been continued until the whole of the 80 acres was in turf, the last field having been seeded about six years ago.

No person who has not had experience will appreciate fully the difficulty and tediousness of the operation of converting, into really good turf, poor strong land which has been constantly under the plough for generations, and in which every bit of vegetable matter has been used up by the practice of having periodical dead fallows dressed with lime. Even with the best plant of seeds, there is after the first two or three years a diminution of produce, and considerable time is required before the turf is fully established. It is only by repeated liberal applications of manure that such land can be made into productive turf.

That portion of the arable land on the farm in question which was best suited for tillage, though lying in contiguous fields, was formerly in a number of small inclosures, surrounded by wide crooked hedgerows abounding with timber. The owner was induced to fell the timber, the tenant clearing out the fences and stocking the old roots, thus laying the 40 acres in two large open fields, which lying high and with a slope to the south, are well adapted to the growth and harvesting of barley, the corn principally grown upon it. This land has been kept in constant tillage and in the growth of corn and roots, clover being taken only at long intervals. A mixed stock of dairy Shorthorns, young cattle, and beasts for fattening has been kept, and at some periods of the year a large stock of sheep has been purchased and fattened. The consumption of purchased feeding-stuffs, and especially of decorticated cotton-cake has been large. The liquid manure from the homestead has all been utilised, being partly collected without admixture of water in a tank, and carted with one horse upon an adjacent meadow, and partly

mixed with storm-water and the drainage from some cottages, and flushed upon the poorer parts of the pastures which lie conveniently below.

The occupier, a member of the Lincolnshire Farmers' Association, has used their mineral superphosphate (which is supplied to members at a low price, with a guaranteed analysis of 26 per cent. of soluble phosphate), in conjunction with nitrate of soda, with marked benefit upon the turf, corn, and turnips. The dairy cows, feeding beasts, and young stock, have been fed with cake through the greater portion of the year. Extra cattle and sheep have been bought and liberally fed whenever there has been room for them and a fair prospect of profit.

The result of this mode of farming, carefully and intelligently pursued, has been the conversion of 80 acres of arable land, before unprofitable, into productive turf, which is improving year by year, and some of which is now worth 20*l.* per acre more than if it had been kept in tillage, and this increase in the value of the land is alone due to the enterprise and capital of the tenant, the whole outlay, with the exception of the cost of the seeds, and a half-dressing of bones upon one field, the first permanently seeded, having been made by the tenant. There has also been a great improvement in the condition, and an increase in the produce of the old turf.

The tenant, who, if he had continued to plough as widely as when he entered upon the farm, would have had difficulty in maintaining his position, has been enabled to make his farming pay, although burdened with the necessarily expensive and tedious task of turning poor arable land into good pasture.

An article which appeared in the 'Pall Mall Gazette' last year, and attracted much attention, was headed 'More Grass, Less Beef,' and urged that the permanent seeding of land would result in diminished production of meat and dairy produce. Such has not, however, been the case on the farm in question, where the gross returns of these two items have been more than doubled.

The number of labourers employed is less than before, but they are better paid, and the diminution of unprofitable and therefore often ill-paid labour is no cause of regret.

Upon the same estate as the farm I have described are many farms similar in character, and naturally quite as good as the one I have described. Most of these are still farmed in the old-fashioned way without lessening the proportion of arable land, and without any great outlay in purchased feeding-stuffs or manures. Some of them, after frequent changes of tenancy and consequent loss of condition, have been let at an unavoidable reduction in rent. In other cases the tenants have notoriously

lost capital, and the condition of their farms has undoubtedly retrograded in the past twenty years.

My friend, convinced of the advantage of dealing with poor clay in the way described, has purchased at a moderate price a small neighbouring farm, which hung on the market in consequence of its unprofitable arable land. He at once commenced seeding the arable land with permanent seeds without a corn-crop, top-dressing the young seeds with nitrate of soda and superphosphate, and grazing the produce with young cattle consuming decorticated cotton-cake. He intends keeping the land in his own occupation until the turf is well established by a continuance, for a few years, of this very liberal treatment.

The example of farm management which I have described appears to me very suggestive of the way in which some of the land now sorely needing improvement, and a continual source of loss to the occupier, may be placed in a state more satisfactory to both him and the owner. Wherever there are any farm-fields in tillage which are at all adapted for pasture, and the average crops of which, under good cultivation, do not pay expenses, their permanent seeding should be attempted, the only alternative being planting with timber. When seeded down properly such fields are always of some value for pasturage, and they may be occupied with very little outlay in labour. With a liberal and continuous expenditure in manures and feeding-stuffs consumed by the stock grazing such land, the improvement, though in many cases slow, is sure.

Unfortunately there are but few tenants in the occupation of such farms who have the necessary capital, the knowledge, and the confidence in the permanency of their holdings to dispose them to carry out unaided such great permanent improvements as are involved in the thorough performance of this work. Landowners should take every means to encourage those tenants who are able and willing to carry out this work.

No agricultural custom or agreement that I have yet seen sufficiently recognises the great value of such work as the conversion of poor unprofitable clay arable into productive pasture. There are often allowances more than enough for marling, liming, or dressing with undissolved bones, which, though doubtless valuable improvements on special soils, are always costly, and on unsuitable soils often unremunerative.

Such work as that I have described, by which, in fifteen or twenty years, the actual agricultural value of the fields treated may be increased 20*l.* to 30*l.* per acre, and the letting value doubled, should be appreciated at its true value by landlords and their agents. It must not be forgotten that the tenant who makes a large outlay in this work can only reap a due return very slowly, and is

quite in a different position to the ordinary occupier of arable land who by one or two corn crops may draw out of the land the extra condition he has put into it. Not so the occupier of young turf, if his only security for the repayment of any portion of his outlay is the power to break up the land again, and thus partly destroy his own improvements without benefiting himself. The occupation of a farm of the nature I have described is not attractive to a man of capital and enterprise unless the terms be easy and he has confidence in the permanence of his holding.

Mr. C. S. Read, at a recent meeting of the London Farmers' Club, said that "his advice to a farmer about to take a heavy-land arable farm out of condition was, 'Don't;'" and that "the natural solution of the problem was that a good deal of such land ought to go to grass." In the absence of a tenant able and willing to carry out the work thoroughly it will be in some cases necessary for the owner to take it in hand for two or three years, to clean and seed the land with well-selected permanent seeds, to top-dress with bones or other suitable manures, and then to let it to the best tenant procurable on such terms as to encourage if not to compel liberal top-dressing or cake-feeding, and of course to prohibit the breaking up again of the turf.

Where help and encouragement are needed, it may in some cases be good policy for the landlord to pay to the tenant 1*l.* or 2*l.* per ton for decorticated cotton-cake consumed on the land, on production of satisfactory vouchers. The manurial value of this food is placed by our leading agricultural chemists at from 5*l.* to 6*l.* per ton, being higher than that of any other cattle-food; and although this value is theoretical and doubtless in practice liable to large deductions, a very large consumption of this cake leads me to attach a high value to its manurial properties. Generally speaking, the most economical means of improving pasture-land is by the judicious use of this and similar foods rich in nitrogen.

Many farmers never use decorticated cotton-cake, and are ignorant of its value. If by the payment of a small tonnage landlords can induce tenants to begin its use, the money will often be well spent, as the value of cake-feeding once experienced, the practice of using it will not be wholly relinquished.

In order to describe a little more in detail the actual process of seeding down land, I will state what has been done by my father and myself on my own holding, within the last thirty-five years, within which period 100 acres have been permanently seeded. The climate here is cool and better suited to grass than corn, and many of the fields are stiff clay and hilly, thus

being ill-adapted for tillage. Those fields, formerly for many years under tillage, but which were least desirable to till, have been one by one permanently seeded, usually with a corn crop; and by repeated top-dressings and the liberal consumption upon them by cattle and sheep of purchased feeding-stuffs, they have been gradually improved and brought nearer the value of old turf. My proportion of arable-land is now less than one-sixth, and I do not propose to lay down any more of my present holding. I should, if my land were suitable, much prefer a larger proportion of arable for the growth of roots and straw in larger quantities as winter provision for stock, and my advocacy of seeding down land is not intended to apply to that which can be profitably farmed as arable. By liberal manuring I grow heavy crops of roots and straw upon the limited area of land I have in tillage, keeping all my land in crop, and only taking clover at long intervals.

I will proceed to give the particulars of the last field permanently seeded in the spring of 1874. It is a steep hilly field of six acres, sloping to the north, with a strong marly soil, which had been ploughed for generations, and was in wheat in 1873. The stubble, which was clean, was ploughed in the autumn, and left untouched until the following May, the furrows being thoroughly pulverised by the winter's frost; it was then scuffled and harrowed down level, and on the 8th of May the following mixture of clover and grass seeds was sown on the freshly stirred level surface with a barrow drill, and simply rolled in:—

	lbs.
Meadow Foxtail	12
Cocksfoot	18
Hard Fescue	6
Meadow Fescue	12
Tall Fescue	6
Italian Rye-grass	24
Pacey's perennial ditto	48
Crested Dogstail	6
Poa nemoralis	12
Poa trivialis	9
Timothy	9
Trefoil	12
Ribgrass	6
Cowgrass	18
White Clover	18
Alsike Clover	12
	228

18 lbs. of rape were also sown.

Although the weather was rather dry the seeds came up well. Two or three cwts. per acre of mineral superphosphate (26 per

cent. soluble) were sown early in July, and three weeks later 1½ cwt. per acre of nitrate of soda.

A very strong and thick crop of rape and seeds was the result, and this was eaten on the land by young cattle and sheep, having cake, in September; the field being then cleared of stock for the winter. On the 30th of March following, 2 cwts. per acre of dissolved guano were sown, and a luxuriant growth of seeds was eaten off by dairy cows and fatting sheep from the middle of April to the middle of May. Eight loads per acre of good rotten dung were then applied, and the clover was grazed by a mixed stock until October. On the 24th of March following, 1½ cwt per acre of nitrate of soda were applied, and the land was grazed by dairy cattle. One cwt. per acre of nitrate of soda, with the addition of 2½ cwts. of mineral superphosphate, was applied the succeeding spring. The field now forms part of a regular dairy pasture, the fences separating it from the older turf having been taken up when the turf became firm enough to bear heavy stock. The turf has passed through its most critical period, and is doing well. Some of the land where the stock do not lie down on the sloping hillside will require some additional top-dressing, otherwise the turf is well-established. The cost of the artificial manures applied does not exceed 5*l.* per acre, being less than the cost of one heavy dressing of bones or lime, and the economical result has been better than from one large and expensive dressing.

In my experience, the most economical way of making new turf productive, or of sweetening and increasing the produce of poor coarse old pastures, is by combining the application of occasional light top-dressings of nitrate of soda and superphosphate, or Peruvian guano, with the consumption upon the land of feeding-stuffs of high manurial value.

Another field of very tenacious clay, 8 acres in extent, was permanently seeded in the same spring as the one last described, the seeds being sown on the 15th of April upon growing wheat. The wheat proved a strong crop, and smothered some of the seeds; they have not succeeded as well as those in the other field, although they are doing fairly well. The field has already received two top-dressings; and as it lies near the homestead convenient for the application of farmyard-manure, whenever it can be spared from other crops, I expect in a few years to make it fair turf.

The comparative advantages of seeding down permanently with or without a corn crop depend upon a variety of considerations. Where thoroughly bad tillage land has to be dealt with, it is often the best plan to sow the seeds without a corn crop. The

young seeds sown in the spring may, without injury, be topped with the scythe to prevent all annual weeds from seeding, and any blank places may be resown. Where the land is foul, by seeding without a corn crop, more time is afforded to clean it, as the seeds may succeed well sown in the summer or early autumn. Sowing in very hot droughty weather is, however, better avoided. Snails are often very destructive to the young seeds whilst small; a dusting with quicklime, sown in the early morning or evening when these pests are out, is the most effectual remedy. Seeds often take well with a corn crop on land of good quality and condition, and the value of the corn crop may be well worth securing. If the seeds be not sown directly after the spring corn has been harrowed in, the level surface should be again lightly harrowed previous to sowing and the roll only follow the sowing of the small seeds.

The climate and soil of some parts of England are specially favourable to the growth of artificial grasses and clovers in alternate husbandry. Notably is this the case in Cheshire and Lancashire. In these counties, too, bones have a specially favourable effect upon the young seeds, and are commonly applied in autumn after the corn is cut in dressings of from 5 to 8 cwts. of bone-dust per acre. The effect of bones upon seeds in many other parts of England is by no means so marked, and I hesitate to recommend any large outlay upon them until their suitability to the soil of the district has been tested by experiment.

The question of the necessity of draining cold clay land before permanently seeding it, requires some notice. I have drained a considerable acreage of my own occupation 4 feet deep, some of it with very marked benefit, and I fully agree with the commonly received opinion that where land is thoroughly wet efficient drainage ought to be the first improvement, without which any other outlay will be partially wasted.

There is, however, much clay land which does not answer for draining as well as land with an open subsoil. It is wet more on account of its own want of porosity than from any quantity of water in the subsoil, and although thorough drainage is beneficial, it does not always repay the heavy outlay required. When land is in regular tillage, with an annual heavy outlay in cultivation, it is important that no remediable cause should be allowed to injure the crops. When land is laid down to grass, the necessity for drainage is not quite so great. Instances are not wanting in which the owner of poor clay young turf, acting on the assumption that draining and bones are all that is needed to make good pasture, has spent more than 10*l.* per acre on these two items, and with very indifferent results, certainly not adequate

to the outlay, or equal to what might have been obtained by spending half the amount in other manures, and in feeding-stuffs consumed on the land.

Although the depressed condition of trade has lessened earnings, and thus temporarily checked the consumption of meat and dairy produce, while at the same time an immense increase of foreign imports has combined to reduce prices and thus to lessen the profits of grass farmers, the general tendency of the consumption of meat, both here and abroad, is to increase year by year. Therefore, spite of an increasing foreign competition, I do not fear that prices of the best qualities of our home-grown beef and mutton will fall so low as to be wholly unremunerative. The extremely low rate at which many concentrated feeding-stuffs can now be purchased makes their liberal use in many cases profitable, and is one redeeming feature in the present bad times.

The writings of the late Sir Harry S. Meysey-Thompson upon seeding land down to permanent pasture, and upon grass-land management, published in this Journal, vol. xix. Part I. 1858, and vol. viii. Part I. 1872, are well worthy of careful study by all who take a special interest in these important agricultural subjects. They have had some influence upon my own practice, and are marked by sound practical experience.

I feel convinced that the opinion he emphatically expressed at the close of his last paper, in favour of "an extended use of artificial manures on pasture land, and of feeding stuffs to cattle and sheep whilst at grass," has already been in many cases adopted with success, and will continue to gain adherents, unless the prices of meat become greatly and permanently depreciated by increased foreign imports.

XVIII.—*Waste Hill Lands: How they may be Utilised by Pony Breeding.* By J. Nevill Fitt.

In considering the subject of the Horse, and the various means by which breeding him can be made to pay, practical men will not unnaturally turn their eyes towards the moors, hills, and waste lands which are at intervals to be found scattered over all England, though more extensively in the north and west than in other parts. How these desert places of the earth are to be rendered profitable is a problem that many have been trying to solve for years, with no great amount of success. In some parts the land is actually so poor and sterile that it can never pay for cultivation; while in others the climate is such as to

render corn-growing a most precarious occupation. In consequence the endeavour has been made to utilise them by feeding sheep and cattle. It seems to me, however, that the indigenous stock of such places, and the one most likely to pay if well looked after, is the pony. Go into whatever district you like of this character, and there he is to be found, rough, shaggy, small, and, for the most part, poor, ragged-hipped, and woe-begone. Not alike in all parts certainly, for the Highland sheltie is not like the Welsh pony. He again differs from the Exmoor, and the Exmoor from the New Forest pony, according to climate, soil, herbage, and other influences, to which I shall allude farther on. These are, in my opinion, the indigenous horses of Great Britain. In tracing their characters as far back as any record of them is extant, we find that the Romans, who had in turn encountered almost every known nation, had a wholesome dread of the British cavalry and chariots, so much so indeed that Cæsar especially mentions their skill and activity. No doubt when the original tribes retired, as they are believed to have done, westwards, into Wales, Devon, and Cornwall, they took their herds of horses with them. In the mountain fastnesses of those counties, where for generations, after the rest of England was overrun and conquered, they held a bold if somewhat insecure footing, living a life somewhat akin to that of Eastern nations, and using their mountain-bred ponies for war and the chase—not to encounter the mail-clad squadrons of the Normans, but as the means of securing a speedy advance or retreat, unencumbered as they were with the *impedimenta* of baggage. Shoes were unknown to them, consequently blacksmiths were not wanted, and the pony could scarcely meet with more scanty fare, go where he would, than on his native hillside. I believe that our Welsh and Exmoor ponies are literally and truly descended from the horses that called forth the encomiums of Cæsar (as no doubt was the almost extinct packhorse); and, inasmuch as they have in a great measure lived a purely natural life, many of the mares having never been haltered, I think we now get them, though certainly reduced in size, with all their original hardihood and soundness. The Exmoors, no doubt the best of all our pony breeds, are supposed to have come over with the Phœnicians, who in remote ages traded to the Devon coast for tin, or at any rate to have received a strong impression of Eastern blood from that source. They are generally of a buffy bay colour, with mealy nose, or darkish brown; and the uncrossed ones are generally under 14 hands in height, thicker through than the New Forest pony, and showing more blood than the Welsh, while the Highlander is a mere carthorse by the side of them. Whatever was their origin,

there can be no doubt of their standing quite at the top of the tree amongst ponies, and this I think points clearly to a *very early* infusion of Eastern blood. The earliest of their race, whose history has been recorded, is the most celebrated, and no one has ever been in the West Country amongst horse-loving men who has not heard of "Katerfelto." Much mystery surrounds him, and divers are the legends anent his origin. I presume there is no one unacquainted with the grey stallion in Whyte Melville's story of that name, and very poetically conceived is the idea of that incomparable horse, and the way in which he became a "Forest sire;" yet I fear we must read it with the remembrance of a poet's licence in full view, though the biographer of the Rev. J. Russell, in 'Baily's Magazine,' so far endorses it as to say that he was eventually recaught, and ended his days in the possession of Mr. Russell's family. The latter assertion of the real, not the poetical, Katerfelto, being probably true.

That pleasant, though not invariably correct, writer, the Druid, says, "Katerfelto's dam, after being stolen by some gipsies, was recovered in foal with him to an Arab. Independently of his fine stock, which is still referred to in nearly every pedigree, Katerfelto was a mighty hunter, and earned deathless glory, both for himself and his owner, a lusty farmer, by taking the bit between his teeth on the Barkham Hills, and carrying him bodily over a twenty-foot gap in an old Roman iron mine."

Another account, published, I believe, by a gentleman signing himself "North Countryman," in the 'Sporting Gazette,' a few years ago, appears to me to bear the strongest stamp of being authentic. It is as follows: "Katerfelto was the name of a little stallion who filled the south with stout and valuable stock, and his history is this: Katerfelto's dam was a beautiful black Galloway, belonging to Mr. Abel, a surgeon of Tiverton, in the year 1778. She became the property of Mr. Stanell, who bred a colt from her by a horse called Sportsman, then covering in the parish of Olseford (query, Was Sportsman and the Druid's Arab one and the same horse?). At Mr. Stanell's death this colt was purchased by an attorney, under a pretended commission for the late Sir Thomas Acland, together with a brace of fine pointers. A friend of the baronet congratulating him some short time after on his well-judged purchase, Sir Thomas thought he was bantering, and told him that he had bought neither colt nor dogs. The other spoke positively to the property having been knocked down to the man of law for Sir Thomas. On discovering the deception, the worthy baronet realised the joke, claimed the colt, and, from the attempted juggle, named him Katerfelto, after a character at that period highly celebrated as the emperor of conjurors.

"At Sir Thomas's death he reverted to the same attorney, and shortly after found his way into the stables of Mr. Roakes, a dealer in Exeter. We next trace him to Totnes, and thence to Rubus, in Cornwall, where he stood several seasons, and got most beautiful stock even from inferior mares. Being now well stricken in years, he fell into the possession of a servant of Major Glynn, of Glynn, near Bodmin, who almost starved him in a severe winter. In this state, snow-fed and covered with vermin, he was purchased for the trifling sum of five guineas by a clergyman, from motives of humanity. Mr. Russell was his name, an accomplished scholar, an excellent companion and warm-hearted friend. He then lived at Southill, near Callington, Cornwall. He had the satisfaction of restoring the old horse to full vigour, and sold him to Mr. Martin of Saltash, in whose possession he died, ætat. 26, and perfectly sound in wind and feet. The cause of his death was inflammation of the roots of the tongue, which choked him. He was barely 14 hands high, his colour a dark bay. The symmetry of his forehand was peculiarly light and beautiful.

"Like the Jews, he stamped his likeness so decidedly on his progeny, that they can never be mistaken who knew him; and most old sportsmen in the east of Cornwall and north of Devon have a long history to tell of his exploits or those of his descendants. A ravine is pointed out on Exmoor, over which he once carried a very heavy farmer. It measures 16 feet across, and 22 feet in depth. Thus lived and died Katerfelto, the quadruped, and the country still rings with his fame."

Even to the present time many a man that you meet with the Devon and Somerset staghounds will tell you that he is on a bit of Katerfelto blood, and I have seen good, fair-sized hunters carrying men sixteen stone, of which the boast has been made. One man with whom I rode home after being once all but lost on the moor, was very strong in the praises of a good-looking bay which had carried him many seasons, and after expatiating on all its excellences, said, "But there! he comes of the old Katerfelto blood, and it's not to be wondered at." He, like many others, gave them the character of being exceedingly stout, but inclined to be high-tempered. It is astonishing how jealous the Devon farmers are of their own strains of blood, and I have heard a tale of two who, having dropped in for one of those clinking runs across the moor which occur when the hounds chance to be laid on a light deer, pursued the even tenor of their way in company until one, either finding his pony had pretty nearly had enough, or fancying that it would be as well not to get further from his own Barton, exclaimed, "I shall pull up, Bill, I have had enough for to-day." "Oh, come on," replied

the other, "I can go on yet." "Ah, if thee canst go on yet, remember though 'tis my blood thee beest riden upon," sung out the original speaker. Well may they be jealous of them, for it is astonishing to see what the little fellows will do over this wild country under the weight of full-grown men. Dr. Collyns, in his work, 'The Chase of the Wild Red Deer,' says, "the thanks of the community are due to Sir Thos. Dyke Acland for keeping up the breed of that diminutive but truly thoroughbred animal the Exmoor pony. I believe the animal *pur sang* can be obtained from the worthy baronet alone. Annual sales take place of *so-called* Exmoors at Hampton and elsewhere, but these ponies are generally cross-bred, though they have Exmoor blood in their veins, and are from their size better adapted for general purposes than the native animal. In the year 1816 I bought an Exmoor pony for *twenty-three shillings!* (a fair price in those days) at Simonsbath. When 'haltered,' caught, that is, after I had concluded my bargain, and secured for the first time in his life, he proved to be two years old. I gave him to my brother's son, a child of four or five years of age. The boy learnt to ride upon him, and his brothers and sisters, eight in number, afterwards used him in succession. The pony was but 11 hands high. He died at the age of twenty-three, and after he had reached his twentieth year carried my eldest nephew, his first owner, then grown up, and by no means a light weight, in a run with foxhounds in such a manner as to excite the surprise, and I may add the envy, of many sportsmen *apparently* better mounted. Let any man see one of these 'little horses' living at grass, and probably never having tasted corn in his life, carrying a full-grown man through a long day with hounds up to the finish; let him ponder for a moment over the animals' strength, courage, bottom, speed, and endurance, and he will not be surprised that their merits have been discovered and appreciated." Dr. Collyns is undoubtedly right as to Sir Thomas Acland being the only present possessor of the true forest-breed of ponies, which some years ago he removed to Ashway Hat, just above Torr Steps, in the neighbourhood of Winsford Hill; as Mr. Knight, on buying the greater portion of Exmoor Forest, immediately commenced improving the breed of ponies, his first, or nearly his first, venture being with Gondola sires. Whether this was a very judicious venture I may take leave to doubt, as the most authentic accounts that have come down to us represent them as 16-hand blacks or black-browns, with high action, Roman noses, and drooping quarters; but to set against these defects they seem to have been very clear-winded and enduring, as were their descendants. Whatever they might have done for horses, they are not the cross I should have selected for ponies.

Then came Pandarus, by Whalebone, and Campus of the Velocipede blood ; Old Port, a son of Beeswing, came later on ; and the endeavour to carry out the improvement was followed up, until the farms were let and the ponies had to return to the Forest, where it was found that the cross-bred ones could not stand the winter there as the old blood could, and to that as far as possible they returned. When the Sparkham pony out of Bay Lilias was a crack, she and Milton, by Old Port, were a good deal thought of, as also were Hero, Nelson, Chanter, and a Pandarus pony.

Let me now say a few words about their cousins and neighbours in the New Forest. Here it is said, but on what authority I know not, they had the advantage of a very early and good cross of blood, it being that of a no less renowned sire than Maske, who got Eclipse. There is also a tradition, which I believe rests on equally uncertain foundation, that pure Arab stallions were many years ago turned out here to improve the breed.

Be that as it may, the Forest ponies have always been held in very high repute, and some wonderfully clever little animals have been brought away from its wilds, though fairness compels me to admit that generally they are not the equal of the Exmoors, being narrower, weedier, and more cat-hammed. By the way, it is a curious coincidence, and one which should weigh with those who have so clamoured for the parcelling out and breaking up of the New Forest, that the deer, when red deer were here, were never so fine and heavy as those to be found on Exmoor, and the ponies were never so thick and strong. This is, no doubt, the effect of soil and climate, and may at once determine us that if Exmoor does not pay to bring into general cultivation, the New Forest would scarcely do so. Nevertheless, the little Forester is a pure-blood pony when in his best form, and shows all the characteristics of high breeding ; moreover, he can gallop, and go on, and stand any amount of work. I remember being taught to ride on one that must have been well on to twenty years old, at the time that I began my lessons, and a perfect wonder she was. Although not more than 13 hands 2 inches high, she carried my father (by no means a light man) as a summer hack for years, and was, in truth, the only one he cared to throw his leg over when the ground was hard ; and although, from bad management of her feet before coming into his possession, she suffered at times from corns, I never remember her making a mistake. She could jump her own height, trot a great pace when she settled down to it—which it was not very easy to get her to do—and was very fast in the gallop. She never had anything but a plain snaffle in her mouth, and never felt whip or spur, while no journey or day was too long for her. She was of the long, low order, with

a large but good head, ragged hips, goose-rumped, and cat-hammed, being also what is called sickle-hocked, and in temper as irritable as you like. Very probably, from her size, she had a cross of other blood than pure Forest in her. Another I knew, of about 11 hands in height, very similar in shape and temper, who did good work in saddle and harness for years, and, to the best of my belief, is still going. In fact, I may say of the New Forest pony what Captain Shakespeare did of the Deccanee tattoo: "From the time he is foaled, he is brought up on what he can pick up for himself round his village. This, in hot weather, becomes rather a precarious livelihood. His growth is thus stunted, and he is often found cat-hammed, and his fore-feet wofully turned out, and otherwise more or less debilitated, from the consequences of starvation. But when he has had a few months' good feeding, our rugged friend comes out with a little muscle on him; his small blood-head, with its large eyes, is carried a little higher than before; and, to his owner's great delight, if he is a hog-hunter and a light weight, some fine day he finds that the Deccanee tattoo runs into his hog in rather a short distance, and beats heavy riders on large horses. Twenty miles within the hour have been galloped by these little Deccanees on two occasions, which are on record; once by a little dun mare, who was only an inch or so above pony-height. There was a Deccanee pony in Madras, I think in 1838, who ran his mile and a half in about 3 minutes and 6 seconds. I myself, though riding 13 stone, with saddle and all the apparatus for shikar, have killed a hog off a small Deccanee Galloway single-handed, and in the evening, when hogs are light and run their best. In spite of the disadvantages of being put to work very young, they stand knocking about often till twenty years of age."

This description of these little Eastern horses reminded me so strongly of our own Forest ponies, that I could not help quoting it. Let me now show that, good as are their performances, we can find records of English-bred ponies who have done nearly or quite as well. In the 'Sporting Magazine' for October 1814, there is a portrait of Squib, late Mouse, then the property of Lord Charles Kerr, painted by Cooper, and the following description:—"Squib (late Mouse), 11 hands 3 inches high, was bred by Mr. Grover of Farnham, and got by a son of Patriot out of a Forest mare; was afterwards sold to Samuel Andrews, Esq., of the same place, in whose possession she went from the eighteenth milestone at Egham to the thirty-eighth milestone at Farnham, 23 miles, in an hour and a quarter, an hour and a half being the given time, for a bet of 50 to 15, which she did with the greatest ease; betting 100 to 10 against the performance. In a fortnight after the

race, on Hartford Bridge Flat, for a considerable sum, 3 miles in 8 minutes, 9 being the time allowed her; even betting. Both times carrying a feather." This is, I think, a fair sample of what Forest ponies can do when a little dash of extra blood is thrown in.

I must now turn to the Welsh, of which breed I certainly have had less experience, though one of my earliest mounts was on a chestnut cob reputed to be from Wales, who was as good and clever a hunter for his inches as man ever crossed, and as hard as a stem of old heather from his native hills. On him an uncle of mine hunted and ran down, with the aid of an old harrier bitch that had just left her whelps, an outlying buck in August 1839, after a capital run, and many is the good chase that the old chestnut went gallantly through, though, if my recollection serves me rightly, he was more a cob than a pony, and must have been not less than 14 hands in height. In fact, my idea of the Welsh breed is that they are coarser and show less blood than the Exmoor, and are as a rule bordering more on the cob stamp. No doubt they are very hardy, and many of them are capital roadsters, and can get along in the trot at a most astonishing pace. I find it stated in a book entitled 'Wynnstay and the Wynns,' by the author of the 'Gossiping Guide to Wales,' published at Oswestry in 1876 by Woodall and Venables, that the goodness of the Welsh ponies, as well as the designation of Merlyns by which they are known, is to be accounted for as follows: "Sometime about the reign of Queen Anne, we are told, there was introduced into Wales a Galloway called Merlin, who became the sire of a celebrated stock of Welsh ponies. Up to that period the breed was degenerating, and the only name the Welshman had to describe his little mountain steed was Ceffyl Bach. And thus it is said an ancestor of Sir Watkin Williams F. Wynn introduced at the same time a new race of ponies to the mountains and a new word to the vocabulary of Wales." Be that as it may, they are certainly known as Merlyns or Merlins. Some of the most celebrated Welsh ponies were a few years ago bred just on the outskirts of Radnor Forest, but I have been told that from enclosures and other causes they have become very scarce there of late years.

Crossing the Solway Firth into the counties of Wigton and Kirkcudbright, we come to what was until nearly the middle of the nineteenth century another famous pony-breeding country. They, however, were ponies of somewhat larger size than most of those I have been discussing, though still not up to the standard of horses; and so celebrated were they for hardihood and endurance, that even to the present day any animal from 14·1

or 14·2 to 15 hands showing blood is called "a Galloway," after the name of the county wherein these larger sized ponies were originally bred, in contradistinction to the cob, a stout and often underbred horse of about the same inches. Tradition affirms that these little horses derived their excellence from some Spanish stallions cast on shore there from the wreck of one of the ships comprising the Spanish Armada, but I believe this rests solely on tradition. If there is any foundation for it, their influence was quickly felt, as Gervase Markham, who wrote in the reign of James I., and consequently not any great number of years after the attempted invasion of England, says in his 'Catabrie,' published in 1616,—"There was a certain race of little horses in Scotland called Galway nags, which he had seen hunt the buck exceeding well, endured the chase with great courage, and the hard earth without lameness, better than horses of greater puissance and strength." I have very little doubt that the Galway nags of this honest old sportsman were the "Galloways" of a later date, and this mention of them proves that they were well known and justly esteemed in his time. Perhaps this would rather tend to confirm the tradition of the Spanish stallions having improved the race than otherwise, because the Armada having been dispersed in 1588, there was ample time for the blood to have become distributed all through the district. As these horses were without doubt barbs, or genets the descendants of barbs, when we consider the effect which the first few Arabians imported into England at the end of the seventeenth and commencement of the eighteenth centuries had on our blood stock, it is easy to understand that even a small infusion of Eastern blood, supposing it to be of inferior quality, would make a great impression on the common horses of any district. The barbs, or their immediate descendants, would also be likely to give exactly those qualities for which Gervase Markham praises the Galway nags—great courage and endurance of fatigue, and the power of standing work over hard ground without being affected by lameness, as in that respect the barbs, from the nature of the country in which they are bred, are the hardiest of the hardy at the present day. And there is no reason to believe that they are either better or worse now than they were a couple of hundred years ago. Of late years we have heard little, if anything, of Galloways as a peculiar breed; and, I fear, useful as they undoubtedly were, we must come to the conclusion either that a larger style of horse has usurped their place in the district which was famed for them, or that some more profitable kind of animal in the shape of beasts or sheep has been found to fill their pastures, and it would now be almost in vain to look for them as a distinct race;

nevertheless such an article as the present would not have been complete without a short reference to them.

The Highland pony differs altogether from those I have previously described, and plainly shows his Norwegian origin. No doubt he is a useful beast for harness and to carry home deer from the hills, but I never saw one of them yet that I would ride, as long as I was able to walk. The Shetlands, and those from the island generally, are so small that they are of little use, except for harness and to carry children.

Having given a slight history of the different breeds of ponies now to be found in England, I must turn to the way that in my opinion they could be utilised, so as to make our waste hill lands profitable, and in doing this, I propose to take into consideration the immense rise that has of late years (especially since the introduction of the game of Polo) taken place in the value of all ponies of good blood and superior shape and make, combined with action. In fact I may say that at the present time no animal of the horse kind commands such a ready sale or relatively such a high price as a good cob or pony. Get a pair of cobs well matched that can step, and you may ask nearly your own price for them, and get it too. The other day a costermonger asked me thirty guineas for one he had drawing his truck. Then comes the question, Why should we not try to produce such an article? Up to the present time I believe I am correct in saying that most superior cobs and Galloways are "chance bred." And on my once asking the late Mr. Milward where he principally procured his, he told me "from all sources; when I see one likely to suit me I buy it." And in the same conversation he said that he believed few people tried especially to breed ponies. One of his, I know, was bred for the turf in France, and I believe had won a race as a two-year-old, while others came from all kinds of odd corners.

Given a man to be in possession, either by rent or purchase, of a certain amount of hill land or mountain, the question is, could he not stock it more profitably with ponies than anything else? And I may ask, would not this style of farming open a pleasurable occupation to many young gentlemen, younger sons and so forth, who have some little capital and do not know what to do with it; some who are leading idle lives, others going in for emigration and so forth. Men who would never settle down to the routine of every-day farming occupations, but with a large tract of land of this sort, and the right of sporting over it, may thus combine business and pleasure, and employ their time and capital profitably. A large proportion of this class are capital judges of horses, and thoroughly understand their

management in every way; their business would be really a pleasure, and there would not be call enough upon their time to render it irksome to them.

The first thing to determine would be the number of mares that the hill would carry in its natural state, so as to do them well; for in breeding ponies, as in everything else, we must never lose sight of the fact that starvation must be as far as possible avoided; at the same time what I may term the original stock should live entirely in a natural state on the hill, except in very severe weather indeed. Having determined this, the next thing for consideration is the breed, and here my advice would be to stick to the aboriginal breed of the country, where there is one, save the Highlanders, and where there is not one, I would try Exmoors. Of course a certain number of these must be served with a sire of their own breed to keep up this stock, for we must bear in mind that the improved cross to which I shall presently revert will not bear the exposure of the hill in winter. As they are very hardy and long-lived, as a rule these ponies would be easily kept up to the mark, though it would be wise to draft a certain number of old ones every year, and put in so many younger. Perhaps it would be found more advisable to buy than to breed them, but that is a matter for individual consideration.

The next thing in pony-breeding, to make it profitable and to bring an improvement in the hill-pony, is what sire they should be mated with. Some perhaps would say the Arab, and if he could be got really first-rate, there is a great deal to be advanced in his favour; he is a wonderfully expanding animal, that is to say, he often gets stock larger than himself from big mares, and no doubt he would improve the size of these ponies. Moreover, he is very hardy, and no animal sustains vicissitudes of climate so well; as a rule he is very sound, having capital feet, with legs like bars of steel, while of his endurance there is no need to say anything here. In Sidney's 'Book of the Horse' he tells us of "Little Wonder, a chestnut entire pony under 14 hands high, and well known with the Queen's hounds. He was cat-hammed and goose-rumped; in fact, except his blood-head and well-carried tail, very mean-looking; and yet he could gallop like a race-horse, jump wide places that would stop the best part of a field, and never tired in the longest day. On one occasion, carrying 10 stone, in a field of four hundred, with the Queen's hounds, in a run in which nine-tenths of the field were pumped out and squandered all over the country, he galloped up in the second flight when the deer was being taken; that is to say, five horsemen, some on their second horses, first, and then a little clump led by the Yeoman Prickers. Little Wonder was

the first to get his wind, and begin to crop the grass at the side of the pond where the deer was at bay. This pony was out of a West-country pony by an Arab."

On the other hand, I have seen some very common stock from Arabs, or so-called Arabs, from country ponies, with no action at all; and as I am supposing to breed for profit, I think that, good as the foundation of an Arab sire would be, for the second batch of mares the risk would be too great, and the return too long in coming. Besides, the expense of a really good sire would put it out of the question, as it must be counted by thousands rather than hundreds, though I must admit that at the last Show held in the Agricultural Hall at Islington, one was exhibited by Mr. A. G. Sharpe, under the name of "Sultan," of very perfect symmetry and large bone, which would have been the very horse for such a post, and the modest sum of one hundred guineas was asked for him. He stood 14 hands 2 in., and was quite white. There are two other classes of sires open; one, the trotting-cob or pony, such as Sir George, who has been such a great prize-winner at all the principal shows, and there is little doubt that such a horse as this would get harness action on most of his stock and improve their size; the same may be said of a small compact thoroughbred horse, of which plenty can be found by the man who has his eyes open, that from their size and shape never have the remotest chance of winning a race. They are more difficult to find now than they were formerly, I admit, but still they can be met with, and the outlay need not be very large. That they cannot race is no matter, in fact hack action, which would disqualify them in the trainer's eyes, would here be a *desideratum*, but the horse selected should have legs and feet above suspicion, and his temper should be docile. Myself, I should feel inclined, provided there was a sufficiency of mares, to keep both classes of sire, and use them according to judgment, as no doubt the horse resembling Sir George would get something good for harness work. Neither do I forget that one of the best weight-carrying prize-winners that has been out, Colonel Barlow's Beckford, was only two crosses from an Exmoor pony, he being by Hunting Horn, dam by Old Port out of an Exmoor mare. So with a blood sire there is always the chance of a big prize in the second generation. Both of them would be the better for earning their keep, and if the owner is not too heavy there is no reason why a compact strong little blood sire should not carry him as a hunter in a wild hilly country, or the trotter take his turn in harness, with proper care and management; and not only the horses themselves, but their stock would be healthier and better for the work. They should also earn their keep in another way amongst the neighbours' mares in the season. In

all probability there would be a small amount of arable land round the homestead, and if this was cultivated with the light Devonshire style of cart-mares active and hardy, the blood sire would do good service also amongst them, and some very useful stock would be the result.

With the mares all properly mated, there would be little to do by the speculator, at any rate until foaling or, I should say, weaning time; and the interval would be profitably employed in seeking out sheltered spots for enclosures with south aspects, where there was a prospect of better herbage, in stubbing up all gorse patches and sowing their sites with the grasses best suited to the soil, clearing brackens, and so forth, not to mention waging a war of extermination against rabbits and such vermin. In fact, he could hunt, shoot, and fish to his heart's content, for I suppose no one would undertake such a speculation who could not afford to wait until the return came. At weaning time, of course, all the young stock would be gathered together, put into sheltered places, and done as well as circumstances would allow for the first winter. Then a selection of the best fillies would be made for stock, not to run wild on the hill all the year, but to be crossed again with blood sires of substance when old enough, and kept to some of the improved inclosures of which I have spoken. The rest would, in my opinion, pay best to get as forward as possible. A great deal of amusement may be got out of handling and gentling them, to any one really fond of horses. And at three or four years old, as the fancy and inclination of the owner may lead him to select, he ought to send some very saleable ponies into the market—good match pairs, polo ponies, covert hacks, and so forth. During the summer, those for sale may either run on the hill or have an enclosure to themselves. At two years old, at latest, they should be handled, for there is nothing like "manners" to sell any horse; and with horses, as with children, manners cannot be inculcated too early. They should also be docked, if requiring it, and put generally into form as much as possible, so as to give each the peculiar style that best suits him. If the mares were well selected to begin with, and I presume none but broad square ones *with action* would be admitted, there would be sure to be a gem or two amongst them. "Don Carlos," Lord Calthorpe's celebrated hack, who afterwards, in Mr. Milward's hands, won several prizes as a pony sire, was bred in this way, by a thoroughbred horse out of a pony mare, and few nicer ones have ever been seen. It is, however, from the produce of the daughters of these mares and a blood sire, crossed again with blood or a *very good* trotting stallion, that I should look for ultimate profit, as these, both from their

nature and being better done, should throw larger stock with some quality. As I have said, they would never take their chance on the hill, as their mothers did, through the winter; but they should get more shelter and better pasture, and when their stock came into the market, good prices may be anticipated. Beyond that cross I should not be inclined to go, as far as mares are concerned; but I would sell off everything, and let those inclined to breed from their produce do it in more favourable localities. I am aware that in advocating such an experiment as this I am going contrary to many arguments that have been advanced; and Mr. Sidney, in his 'Book of the Horse,' says, that where it pays to breed more than the mountain pony, it would pay to breed a still bigger horse, or words to that effect. To these conclusions I altogether demur, as three horses with the mountain blood in their veins, between 14 and 15 hands, would live and grow fat, where two 16-hands horses would starve; and when we look at the demand for this especial class of animal it appears almost certain that in the right hands such a speculation must prove remunerative. That it has failed is, I believe, due to the endeavour to mix up hunter-breeding or larger horses with the pony-breeding in a locality quite unsuitable to the former, and the one has had to bear the sins of the other. Neither is there any guarantee that the men who tried it were likely persons to carry it to a successful issue; and, above all, ponies and cobs a few years ago did not represent half the value that they do at present. In such a case as I suppose, with an energetic man, a croft here and there would be added to the arable land in favourable localities, so as to increase the supply of hay and oats at command, and by the time the mares of the first cross came to foal, considerable improvements would have been effected. Although the horse-stock would be the principal, a few rough bullocks would from time to time be brought in to tear out what the horses did not eat, and to clear up behind them. It would be also advisable occasionally to clear certain enclosures entirely of the ponies and depasture them with sheep, as it is a well-known fact that after a certain time the land becomes tainted by feeding with one kind of stock, and when that is the case they will never do well. But whatever is put on the land, it must not be over-done, but had better keep a less quantity well than a larger one badly. The necessity of providing hay, &c., for winter emergencies is so obvious, that I have not touched on it.

I would never have the mares worked at all, or even shod, because I am convinced that we should breed sounder stock from unworked mares. Look what sound animals "Lecturer" and

"Leonie" were; and Sir Tatton Sykes never had a mare broken. Why are ponies so enduring and free from lameness? because their dams have often for generations run unhaltered. I might also enlarge on breeding troop horses in this way, or with mares from the third cross, perhaps on rather better land, not large, but sound, hardy, and enduring, fit to stand the hardships of a campaign, with a moderate weight on their backs, instead of a load for a van; but space is wanting, my tether is reached, and I must conclude. I think I have at least intimated what might be done with our native breeds of horses, properly crossed, upon our at present waste lands. It is not a business that would call for a large outlay of capital: the rent would be little more than nominal of such land as I have in my eye, especially in these times, and to a young man fond of horses and sport the occupation would be one of the most pleasant he could select.

XIX.—*Cow-Keeping by Farm Labourers.* By Henry Evershed.

Although farm labourers are, in some respects, better fed than they were a few years since, they were never so badly off for milk. There are numerous villages throughout the country where milk cannot be obtained, where families are badly reared for want of it, and where the children of the labourers never taste it in the whole course of their lives after the day when they are weaned.

There is high medical authority for the statement that the majority of farm labourers are reared on a diet inferior to that of their predecessors. In wealthier families meat may be a sufficient substitute for milk, but in those of the labouring class meat is not available in sufficient quantity. Cheese is the alternative, and is more largely used in building up the frame than any other substance except bread. The low price of cheese is an inestimable advantage in the case of those who are unable to afford the more expensive sources of nitrogenous materials; but cheese taken largely as food is ill adapted for the period of infancy.

The subject of this article, then, gains importance from the fact that the labouring population generally have been deprived of milk, in modern times, as an article of diet. Wages have risen, and many very striking improvements in the position of the labourer have been accomplished; but in the important matter of rearing and feeding his family he has retrograded.

Bearing in mind the medical evidence which has sometimes come before the public on the deterioration of the diet of farm labourers by the substitution of tea, coffee, and beer for milk, one cannot but feel gratified to find that in certain districts they still keep cows. Several years ago I wrote upon this subject in a well-known Review, and described the advantages which some labourers' families in Sussex derived from their cows. I described what I had seen on the estates of the Earl of Chichester and others, and I expressed a hope that proprietors, on suitable soils and in districts where the genius of dairy management exists, would offer the farm labourers on their estates the opportunity of keeping cows. The readers of rural literature need not be reminded that cow-keeping was formerly almost universal among the peasantry of England, and that at a later period farm labourers very frequently kept cows on highways and wastes, under a system which has become illegal, so far as the roads are concerned, and impracticable on the wastes, which, in fact, have been ploughed up. I do not recommend the revival of obsolete and objectionable customs, but when old systems wear out it may be possible to introduce new methods to succeed them with advantage. The cows on Lord Chichester's estate do not run either on highways or commons; they are kept on rent-paying pastures, set apart for them on land in the occupation of a farming tenant, a member of the Royal Agricultural Society of England.

The method of keeping cows contemplated in this article applies to pasture-land only, and it will be understood that my remarks are limited to the pastoral or mixed districts. Labourers cannot keep cows with advantage on thin chalks, the rubbles, or the rag-stones, and they must dispense with them on the South Downs generally and on the Cotswolds; but they might keep many more than they do at present in the Weald and in the intermediate districts generally, which are less pastoral than Cheshire, and more so than Norfolk or the wolds of Lincolnshire. They might keep cows in numerous districts where at present the main obstacle is their want of skill. The seeds of the necessary knowledge might be sown with great advantage in the intermediate districts; and I hope that those proprietors of pasture-land who can spare a few plots of their acres in localities which are at present destitute of cottagers' cows, will visit some of the estates referred to in this article, for the purpose of introducing a system which has proved exceedingly beneficial on those estates.

With a view to obtaining reliable information, I compiled a list of queries and submitted them to a number of gentlemen in various parts of England. My subject aided me, and the zeal

of my informants supplied me with the abundant information contained in these pages. The following is a list of the queries:—

1. Is it desirable that a cow should be kept for a farm labourer's family, or is milk otherwise readily obtainable by the labourer?
2. Should the cow be kept by the man or his employer?
3. In the latter case, what is the customary arrangement in your district?
4. When the labourer keeps his own cow, how much pasture ground is usually allotted to him for that purpose, and what proportion is annually fed and mown, for summer and winter maintenance?
5. Is the pasture hired with the cottage? and is it hired from the owner or the occupier of the land?
6. What food does the cottager purchase, during the year, for his cow?
7. What manure does he purchase for the pastures?
8. How does he obtain litter?
9. Does he sell or consume the produce of the dairy?
10. How does the quality of the butter compare with that of larger dairies?
11. What extra buildings have been necessary to enable a cottager to keep a cow, and what has been the cost of such buildings?
12. What method of assurance has been adopted to secure the cottager against loss in case of the death of his cow?
13. In some parishes there are six or eight cows' pastures lying apart from the cottages, and supplied with tenants as the reward of good conduct, by the proprietor, or by others at his request; do you know of such a case, and could you describe how the letting is managed, and the effect of the system?
14. What are the moral and material advantages of farm labourers keeping cows?

The answers to these queries proved far too voluminous to be placed before the reader in an unabridged form. In many cases I have been compelled to give the substance only of the replies, in as few words as possible, and as a rule I have omitted mere expressions of opinion, and have given the experience only of my correspondents. In several cases useful information has been sent on the milk question generally, by correspondents who do not reside in cow-keeping districts, and were, therefore, not in a position to contribute information on the subject-matter of this paper. I hope that the information thus received on the milk question generally may be embodied in a future article on that subject.

As Cheshire is a dairy county overflowing with milk, I sent several of the lists of queries into that county. The replies were to this effect, that milk, in many neighbourhoods, is not an article of sale. Mr. David Reynolds Davies, Agden Hall, Lymm, thinks that if a certain number of farm labourers kept cows, others might obtain skim milk from them. He adds, that the privilege might be granted as a reward of good conduct, and that the effect would be to encourage habits of thrift, and give the labourers comfortable homes and healthy children. Happily for the labourers on his estate, the largest landowner

in Cheshire, Lord Tollemache, of Helmingham, holds similar views, and has given much personal attention, during many years past, to the practical development of a system which I shall describe in another part of this article.

The Hon. Wilbraham Egerton, M.P., Rosthern Manor, Knutsford, describes some cow-keeping in the village of Knutsford, where a field has been set apart for the special purpose of the milk-supply, and for the encouragement of small occupiers. Mr. Egerton's replies relate particularly to the milk question, but I must quote a paragraph from his letter "On the moral and material advantages of farm labourers keeping cows." Mr. Egerton observes :—

"While it would not be advisable or perhaps possible that all labourers should have a cow, it is desirable to enable the married labourer who is thrifty and of good character to bring up a family of children comfortably, and for that purpose to have a small garden and a cow. It is both a reward of good behaviour and a stimulus to exert himself for his own benefit and that of his master. It indisposes him to leave his place, and may lead to his saving money, and perhaps to his taking a small farm. The great difficulty is about manure: he ought to keep a pig, but he probably has no other manure to put on the ground. I am inclined to think that if possible the landlord should supply the manure.

"When a cow dies, the usual result is that a subscription list is sent round to enable the labourer to replace it."

I propose to quote next the opinion of a gentleman of wide experience, who resides in an adjoining county. Mr. Henry Burd, Hatton House, Shrewsbury, agent for the estates of Sir Baldwyn Leighton, Bart., M.P., Mr. J. D. Allcroft, M.P., and others, holds very decided opinions in reference to my subject. The following are Mr. Burd's answers to my queries :—

"A regular supply of good milk is not readily obtainable, and it is desirable that a farm labourer be in a position to keep a cow. The quantity of pasture-land allotted to him for that purpose is about 3 acres of good land or 4 acres of land that is not very productive, about one-third being mown annually. The cottager purchases very little beyond a few turnips or mangolds and straw, and these are often obtained in exchange for hay. As a rule he spends nothing on manure for the pastures, that from the cow and pigs in a well-managed place suffices. He obtains litter by exchange of hay for straw, or by purchase of fern. He generally consumes all the produce of the dairy except for a small part of the summer. The quality of the butter is generally inferior to that of the larger dairies."

Mr. Burd adds :—

"The chief material advantage to the farm labourer is derived from having a supply of milk and butter for his family, and the profit arising from the sale of any produce not so consumed.

"The chief moral advantage appears to be occupation of a profitable and pleasant character during the leisure hours of himself and family. The

improvement of a man's pecuniary and social position should, and generally does, improve the moral tone of his household.

"The lettings of land should be made as a reward of good conduct, and the applicant should either insure his cow or show that he has more money than may be required to buy one."

Some capital, though rather costly, cottages and cow-sheds erected by Mr. Allcroft, of Stokesay, intended for men who can keep two cows and perhaps a heifer, are shown in the accompanying engravings (pp. 516, 517).

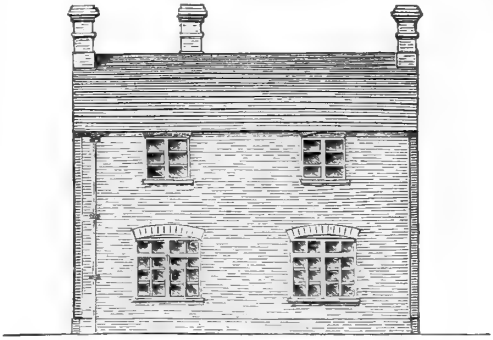
"The cottage privy and pigsty are built of either brick or stone, whichever material is most available in the district; if brick, with 9″ solid, or 11″ hollow walls, with a 2″ cavity; if stone, 18″ solid walls. Damp course below floor level. Brosely tile roof, also Brosely flooring tiles used for lower rooms, boarded floors for bedrooms. Cottage fitted with range with oven and boiler in front kitchen; baking oven, copper, and sink in back kitchen, sanitary drains, rain-water tank with pump in back kitchen, supplied by eaves troughing from the roof; slate slabs or flooring tiles in cement used for milk benches in dairy. All materials of the best description, and the work, including joiners' work, finished, and the cottage fitted in a substantial and superior manner. The cow-house and hay-bay, &c., are built on brick or stone foundations, with framed and sheeted timber walls, and galvanized corrugated iron roof laid on boards; or timber and tiled roof; or sometimes the walls built altogether of brick or stone. The cow-ties fitted with proper boosey and cratch; the floor pitched with pebbles. A small shed is sometimes added at one end, for tubs, coals, tools, &c."

The *average* cost of the cottage and buildings built as above described, the contractor finding all materials and doing the haulage; not including any fencing, but inclusive of drains, cesspools, &c., may be taken (in Shropshire) to be about 340*l.*; the cost of the cow-house alone about 35*l.*; but these amounts will vary within somewhat wide limits, according to the district, position with reference to roads and station, and the cost on the site of bricks, stone, lime, sand, and other materials; and in the event of there being any or all of these materials readily available on the estate, and the hauling being done by the estate team, the contract price will be, of course, very materially reduced.

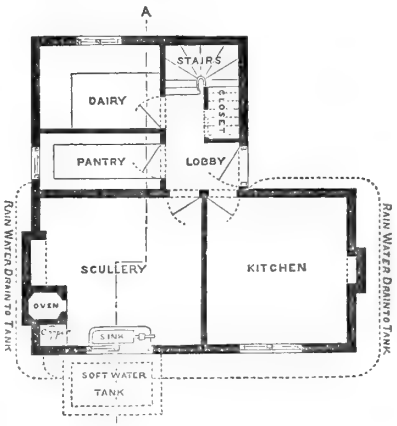
While travelling in Shropshire I was unfortunately unable to visit Mr. Allcroft's estate at Stokesay, near Craven Arms. Mr. Burd writes of it, "it consists of rather less than 6000 acres. We have about 170 small holdings on it. There are about 16 farms, and about 45 cottages are let to holders of from 2 to 3 acres each. Several of these small tenements are let to tradesmen useful to have on a large estate.

"We have not many men keeping a cow who can be classed with a *mere farm labourer*. When a man has saved enough to buy a cow, he generally tries to keep himself more free than a "mere farm labourer" is obliged to be, if he is to secure regular

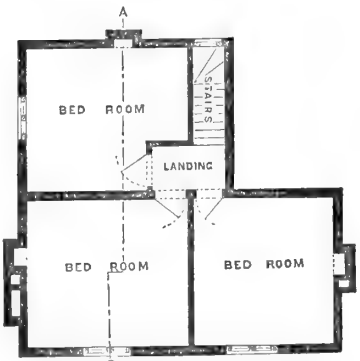
Fig. 1.—*Elevation and Plans of Cottages on the Estate of Mr. J. D. Allcroft.*



SOUTH ELEVATION



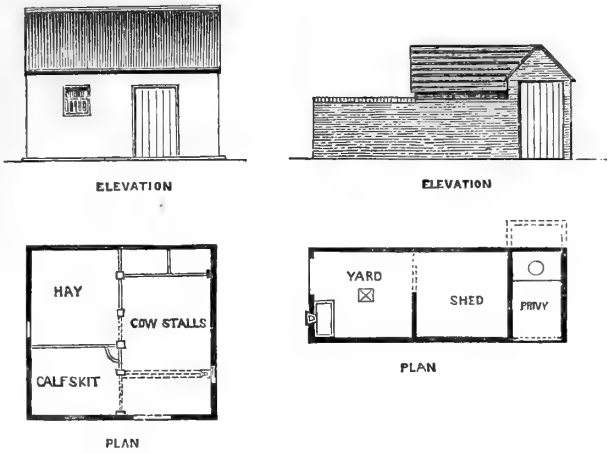
GROUND PLAN



CHAMBER PLAN

SCALE OF 0 10 20 30 FEET

Fig. 2.—*Elevations and Plans of Outbuildings to Cottages on the Estate of Mr. J. D. Allcroft.*



employment. In the case of a man keeping one cow, he does not require a distinct dairy, but having a good cool pantry manages thus very well."

Mr. T. C. Thompson, of Ashdown Park, Forest Row, Sussex, who has given great attention to the subject of the labourer on his estate, replies to my queries that milk is necessary and almost impossible to get. The labourers have almost ceased to use it. Mr. Thompson doubts whether they now esteem it sufficiently to buy it if they had the opportunity. Farm labourers have been seriously injured, he thinks, by the absorption of common lands, a process which is still going on in Mr. Thompson's immediate neighbourhood, where Ashdown Forest (which I remember a common for thirty years past) is being turned into a game-covert.

Mr. Thompson observes of the quality of the butter that it depends very much on cleanliness, which depends in great measure on the kind of dwelling the labourer occupies. His reply to query 10 is, "This depends entirely on the dairy-woman. A want of cleanliness is a common fault of the peasantry of this immediate neighbourhood. Their houses are very often unfit for human habitation." The reply to query 14 is, "I have found by experience that nothing tends to keep a man away from the public-house so much as the possession of property. Even one cow—a man's own—gives him an interest more powerful than lectures, sermons, or concerts."

Mr. Thompson, accordingly, has enabled his farm labourers to keep cows, and has built for them capital cottages. As

"Foresters" they lived, the other day, in hovels; they now reside in houses. As the method of helping the farm labourers of this estate has been to divide the home farm of the proprietor among them, and thus convert them into small tenants, I should quit my subject in describing it, though in doing so the reader would be made acquainted with an admirable example of the patience and the large-hearted benevolence which are necessary to those land-proprietors who would introduce changes and improvements, such as cow-keeping by labourers, into new districts.

I have not met with a single objector to the system of cow-keeping recommended in this article among any persons who are practically acquainted with the system, though some have objected to it who have never seen it. I am glad to reckon Mr. William Smith, Woolston, Bletchley Station, among those who have encouraged labourers in keeping cows in a district where the practice is rarely met with. Mr. Smith says:—

"It is by no means desirable that a cow should be kept for farm labourers, neither is it positively necessary that milk should be readily provided for him, for most of our best men have been raised without any.

"If a cow is kept it should be kept by the man himself, by hiring land of his master or elsewhere, and buying the extra food needed in winter.

"In one case that I know of the man rents a 2-acre field and buys the winter food. In another case the man keeps 2 cows where he rents 8 acres, one half of which he mows and the other half he grazes.

"In the two cases noticed above the land is hired distinct from the cottage; in the former case it is hired from his master, and in the latter case from other owners.

"In the former case the man buys hay for the winter, in the latter case he provides it himself.

"They sell the produce of the dairy in butter and skimmed milk.

"The butter is under an average in quality. No methods of insurance have been adopted."

One of Mr. Smith's men has kept a cow for some years. Mr. Smith does not recommend cow-keeping as a general custom among farm labourers, as he thinks that "in any district where milk is needed, there will be little industrious men spring up to provide it." I am sorry to say that this has not hitherto been the case. Labourers, having lost the privilege of keeping cows, have abandoned the use of milk. They cannot produce it, and they will not purchase it, and have become generally ignorant of its value.

Sir T. D. Acland, Bart., M.P., writing from Killerton, Exeter, repeats the complaint that comes from all quarters of the difficulty experienced by farm labourers in obtaining milk. I believe that Sir Thomas has endeavoured to obviate the evil, but I have not seen his estate; it does not lie in a district where cow-keeping by farm labourers is understood, and the difficulty of introducing the system would be very great. Sir Thomas has

favoured me with a statement in which he remarks that the acquisition of a cow by a farm labourer may be "the first step on the ladder of thrift." Cows, he says, should be kept by the men if they can save money to buy a cow and bear the risk of its death. He has, in a few cases, let out cows by the week, the price depending on the number of quarts of milk yielded by them, the hirer paying on an average about 3*s.* 6*d.* or 4*s.* a week per cow, including the keep of the cow. A cow may be returned when it ceases to pay the hirer, but without any pledge that another cow will be supplied unless it be convenient. The cow runs in a park. The man has to buy further winter food if he wants it. He is encouraged to grow cabbages and roots for winter consumption, hay being an expensive food in the district. In some other cases Sir T. Acland has allowed the run of a cow in a park, or on open ground or on rough pasture in a wood, to a gardener or a trustworthy woodsman or drainer. This has led in one case to the man saving money and, on being in a position to rent 3 or 4 acres of land and to keep more than one cow, selling milk to the neighbouring hamlet, or making butter for the market. One or two of Sir T. Acland's tenants let their foremen have the milk of a cow as part of their earnings.

Sir Baldwyn Leighton, Bart., M.P., whose father established an elaborate system of "small takes" on his estate at Loton Park, Shrewsbury, replies to my queries to the effect that the cow should be kept *by* the labourer, not *for* him. On his estate, from 2 to 4 acres of pasture adjoining the cottage are allotted to the labourer for that purpose, and both are hired of the owner of the land. The skim milk is consumed at home; the butter is sold. The cost of the cow-house which is necessary to enable the cottager to keep a cow has been from 10*l.* to 15*l.*; or less when the labourer has himself erected it. The land for the cow should be regarded as a prize for thrifty workmen who have saved money. Sir Baldwyn has been good enough to send me his paper read before the Social Science Congress at Plymouth, in 1872, to which he has referred me for replies to some of the queries I had addressed to him. He there states that pauperism had been virtually exterminated in a certain district where, for forty years past, the interests of the labourers had been intelligently cared for, more especially by selecting the most thrifty to hold small plots of land where they could keep a cow. "It would be incredible," Sir Baldwyn Leighton observes, "to some of those who have never offered to the labourers a means of rising by holding land, to see the way in which men will slave and save to obtain these small prizes; and the amount of self-respect, education, and comfort which their acquisition, wisely conceded, will produce."

At Loton Park, on the home farm, four labourers out of six have grass-lands and keep cows. Their wives attend to the cow and do almost all the labour required, and there has never been the slightest difficulty in their wishing to be at home when wanted on the farm. The net profit to them from a cow has been 5*s.* or 6*s.* a week.

On several estates which I have lately visited, where the labourers have been encouraged to keep cows on a well-organized system, the tenants have expressed themselves in language very similar to that of a tenant farmer whom Sir Baldwyn quotes. He says: "It is quite remarkable what effect the possession of a cow-gate has upon a labourer; he seems quite a different person; he does his work much better, in an honest, cheerful way, as if conscious that he was not forgotten by those who employed him."

Most unfortunately neither tenants nor landlords, as a rule, are readers of agricultural literature. Mr. Dent, of Ribston Hall, who has cordially assisted my inquiries, devoted several pages to the subject of labourers keeping cows in his very able paper in this "Journal," on "The Condition of the Agricultural Labourer," 1871, p. 351. These few lines may perhaps be allowed to reappear. "In the Northern and Midland Counties, again, the labourer very often has the advantage of such an allotment of grass land as enables him to keep a cow, and to obtain milk for his children, besides realising some money by the labour of his wife and family on his own land, without their going out to work for hire; and there is, perhaps, no method by which a landlord can more certainly add to the comfort of the married labourer than by letting to him grass for a cow."

Writing from Ribston Hall, Wetherby, Mr. Dent describes the practice on his estate as follows:—

"Milk is most desirable, and very difficult to obtain. Many farmers here do not keep more than one or two cows for the supply of milk and butter for their own use, preferring to buy Irish bullocks and feed them, to the breeding and rearing of stock.

"The cow should be kept, I think, by the man himself; there is always this difficulty about keeping cows; if a man has one he is desirous to have land enough to keep two, and then his time is much occupied in looking after his own stock.

"The labourer rents directly under the land-owner.

"I find that about forty-five years ago there were on this estate forty-four small occupiers, the smallest about 2 acres, the largest up to 17. Many of them occupied from 3 to 5 acres, and these were labourers keeping cows. They would mow for hay about an acre and a half, and many of them had a rood of arable allotments, on which they grew straw. Of these small occupations about thirty-one now exist.

"At the earlier period, more than half the occupiers had separate takes, although one meadow of about 16 acres was and still is let amongst cottagers to mow, and there are still three or four pastures shared in common by two

or three occupiers. The pastures are all hired with the cottages from the landlord. I have been told that at a still earlier period there was a large common field in which labourers' and small farmers' cows grazed promiscuously, and that there was a general milking time under an old elm in the village. I think that cows are not valued quite so much as they were twenty years ago, and that the use of tea and coffee supersedes that of milk. The cows are kept to make as much butter as possible, and every particle of cream is extracted for that purpose; and then the skim milk goes to the pig. A little cake or corn may be purchased, and perhaps a load or two of turnips; no manure. Each cow-holder has an allotment of one or two roods of arable land, from which he gets a certain amount of straw. These allotments, formerly cultivated altogether by the spade, are now ploughed and sown by small men who keep two ponies, a little plough, and a cart for hire, leading coals, &c.

"The produce of the dairy is all sold. The quality of the butter compares very well with that of larger dairies, and generally commands the top market price.

"I think one reason for the decreased number of cow allotments has been the expense of buildings. By degrees I am, on sanitary grounds, rebuilding most of the cowhouses, pigstyes, &c., and I find it very expensive, and get *no* pecuniary return for my outlay. Many of the old cottages had the cowhouse under the same roof, sometimes communicating with the kitchen.

"On a small estate in the East Riding, several labourers keep a cow each, which grazes in the lanes in summer. They feed them in winter mainly on the hay mown from some large drain banks, which the tenant farmer either gives or lets at a small rent. On this estate the cottages are generally let with the farms, and the cattle-man or head horseman has a cow.

"The advantages should be first a good supply of milk for the children, but as I before said, I fear the desire to make all that can be made of the butter very often spoils the milk. There is always an excellent market for butter in this neighbourhood, and if a cottager has luck with his cow, and if his wife be fond of a dairy, the cow should be a considerable source of profit. But I do not think the labourer is quite so keen about keeping a cow as his predecessor was twenty-five years since. The best of our young men do not seem to care to settle down to country life, and their wives have not the knowledge of the dairy which was possessed by their mothers. Farmers say it is almost impossible to get a good dairy-woman, and in consequence they give up breeding stock, and the same thing applies to the labourer's wife; still I believe the cow, if properly used, is a most desirable adjunct to the labourer's position."

There is a cow-club among Mr. Dent's tenants. On entrance they pay 12*s.* each for each cow; they subscribe 3*d.* for each cow every two months. When a cow dies the member receives 10*l.*, and all the members pay 2*s.* once in two months until the 10*l.* is made up. The money is kept in the Savings Bank.

Mr. Stanhope, one of the Commissioners engaged in investigating the effects of the agricultural gang system, is a cordial witness in the Second Report, 1869, to the thrifty habits induced among labourers, and the comforts which they derive from keeping cows. But although the Report of the Commission is full of the same kind of evidence in favour of the plan, gleaned from Derbyshire, Cheshire, Shropshire, Lincolnshire, Northumberland, Yorkshire, and elsewhere, yet both tenants and landlords, as a rule, are unaware of the merits of the

system; and I can say, with Sir Baldwyn Leighton, that as regards the concession of a cow pasture to labourers, "I have letters of evidence from correspondents in many counties of England showing the advantage of such an arrangement, which many philanthropic men seem never to have heard of yet."

The Hon. Auberon Herbert writes approvingly of small cow-keepers, from Ashley Arnewood Farm, Lymington. Mr. Herbert says "they mostly depend upon waste land by the sides of the roads, but they often rent a small meadow." This refers, be it remembered, to a retired district in the New Forest.

Mr. Richard Stratton writes from The Duffryn, Newport, Monmouthshire, that milk is obtainable at 3*d.* per quart, and that the custom of the labourer keeping a cow is unknown in his neighbourhood.

Mr. J. A. Williams, Bayldon, North Wilts, is not acquainted with a single instance of an agricultural labourer keeping a cow in the arable counties of Wilts and Berks, except where there are cow commons, as at East Ilsley in Berkshire.

Having heard, some years since, of the very large number of cows kept by labourers on the estate in Cheshire, owned by Lord Tollemache, of Helmingham, I felt great interest in visiting the spot. The estate lies in the midst of the Cheshire dairy district. The farms average about 200 acres each, and about three men—cowman, horseman, and labourer—are employed on each. Nearly all the labourers, as well as some of the small tradesmen, on the estate keep cows. There are about 300 cottages; at the time of my visit, 260 of the cottagers were cow-keepers, and before the close of the year seven others were to be added to the number. Any man who finds himself in a position to keep a cow is enabled to do so by an allotment of pasturage to his cottage. About 3 acres suffice for the keeping of a cow, of which about one acre is mown, one quarter of an acre is in tillage, and the rest is in pasture. The rent of the land is the same as that of the adjacent farming land. The cottages are hired from the landlord on a three months' notice, and the tenants of the farms prefer this arrangement to hiring the cottages and sub-letting them, as it reduces their responsibility in the event of the dismissal of a servant. Generally speaking, the 3 acres required for a cow are attached to the cottage, but in some cases a pasture is set apart for cottagers' cows, and 30*s.* per cow is charged for grazing. The mowing land is always attached to the cottage, and, as a general rule, each man has his mowing land fenced. If it is held in partnership, the aftermath of the best farmer will be superior to that of his neighbour, whose cow, nevertheless, will graze over the whole piece. These cases, however, are very rare.

The tenants on Lord Tollemache's estate spoke strongly in favour of their labourers keeping cows, for reasons which have been several times repeated in this article. The organisation of the system is perfect. The butter is collected and marketed by small dealers, residing generally on the estate, and being themselves cow-keepers. Lord Tollemache has himself taken great interest in the development of this system, and the result is seen in a most successful example of cow-keeping by labourers.

In reply to one of my queries relating to cow-clubs, Lord Tollemache says that the labourers themselves manage them, and they answer well; "in proof of which I never by any chance receive a petition from a labourer who has lost a cow. An objection frequently raised to the system is, that those who lose cows go begging about the country for subscriptions; that is not known on this estate, nor would it be elsewhere if cow-clubs were established and well managed."

Mr. Stephen Cawley, Priestland, Tarporley, Lord Tollemache's agent, gives the following information:—

"The labourer has, comparatively speaking, a plentiful board for his family, and at a cheap rate. He has his cow, pig, and land to occupy his spare hours, which might otherwise be spent in the beer-house. His family have an opportunity, from their infancy, of taking part in the management of stock; and this is most necessary, if they are to grow up into thorough stockmen.

"The chief benefit derived by the farmers is, that when they have the nomination of the tenants of cow-keeping cottages, they can obtain the best and most intelligent men, who, but for the advantage of a cow, would drift into the large towns. The cow-house and pigsty cost about 30*l.* The butter is quite as good as that from the larger dairies."

There are, I believe, half-a-dozen or more cow-clubs on Lord Tollemache's estate, the distances being too great for the members to assemble conveniently at any single point. Cottagers and small farmers mutually insure, but large farmers do not join these clubs, which an outbreak of disease in any large herd would bring to ruin. The place of meeting should not be a public-house. The Bulkeley Chapel Cow Club meets at the Primitive Methodist Chapel, Bulkeley. There are about 200 members, and 400 cows. The "New Rules for the Governance and Guidance of the Bulkeley Chapel Cow Club," were printed in 1873 by T. and J. M. Johnson, Nantwich. They contain thirty-four "Articles," which have since been revised by the Managing Committee. The "Rules of the Bulkeley Cow Club," published in the present year, are as succinct as they are sound, and are therefore given here *in extenso*.

"1. This Society shall be called the 'Bulkeley School Cow Club,' and is established for the purpose of making the most effectual provision for

casualties affecting its members in case of loss of cattle. It shall consist of a Treasurer, two Trustees, two Stewards, two Markers, a President, a Secretary, a Committee, and an unlimited number of Members. From the date of these Rules, no *new* members shall be accepted who may reside above four miles from the place where the club is now held.

"2. The Society shall meet on the first Monday in every month, at the Primitive Methodist School Room, Bulkeley: at eight o'clock, P.M., in the summer half-year, and seven o'clock, P.M., in the winter half-year.

"3. Members who have joined this Club previous to the adoption of these Rules shall pay 1*s.* per head as entrance, and 6*d.* per head, per month, contribution. All new members joining after the date of these Rules shall pay the sum of 1*s.* 6*d.* per head, entrance, and 6*d.* per head, per month, contribution, so as to have a full claim on the funds raised by its older members. Each member shall be supplied with a book of Rules at a charge of 3*d.* No member shall be allowed to enter more than six cows, and, should any member have more than that number in his or her possession, it shall be discretionary with the Marker which six he accepts.

"4. Any member neglecting to pay the contribution for four nights shall pay a fine of 3*d.* for each and every beast entered with this Society, and, if he or she so neglect payment for five nights, to be excluded, unless otherwise agreed on by the Committee.

"5. Each member shall pay up all arrears of contributions on the clearance club night in May, and shall also pay up their contribution on the first club night after the clearance.

"6. Any member having resigned or become excluded, and shall again wish to become a member, he or she shall be accepted if there is no former charge against them, on payment of the usual entrance fees, &c.

"7. No member shall be entitled to any claim on this Society before the expiration of fourteen days after entering any cattle. Neither shall a member receive any benefit who is also a member of another Society of the same kind.

"8. The officers shall be elected annually, or old ones re-elected if eligible. The *Treasurer* shall keep the surplus stock of money from year to year, and shall pay all losses, &c., when called upon by members producing a cheque for amount of claim from the Secretary, and signed by a Steward or Stewards.

"The *Trustees* of this Society shall invest in the National Provincial Bank such sum as may be considered necessary as a standing stock for the purpose of meeting any heavy losses it may sustain, such sum to be invested in the name of the Bulkeley Cow Club. The Trustees shall not withdraw any of the stock without the sanction of the Committee, but shall be empowered to receive the interest arising from stock yearly, and pay it over to the Club. The Trustees shall remain in office during the pleasure of the Society.

"The *President* shall preside at all meetings of the Society, and, each club night, shall receive all money from the hands of the Stewards, and shall convey it to the Treasurer, together with a note from the Secretary certifying the amount.

"The *Stewards* shall attend every club night, or in default be fined 1*s.* or such sum as may be decided upon, and shall receive from members all contributions, entrances, fines, &c.

"The *Secretary* shall attend each club night, and enter all contributions, &c., in the pence book and on the members' cards. He shall also attend and take minutes of the proceedings at all meetings of the Committee. He shall draw out a balance-sheet every year, showing the state of the Society's funds, and make out a rate of dividend to each member at any time it is considered requisite to divide any surplus stock.

"The *Markers* shall be required to be competent judges of cattle, and each

one shall have a certain district allotted to him by the Committee, and shall attend to mark any cattle within six days after receiving notice, or be fined 1*s*.

"9. Each Marker will be provided with an Iron for the purpose of marking cattle. The mark must be burned on the horn or the hoof, and the owner shall pay the Marker 4*d*. per head for marking. Should the Markers go to see any cattle and not think proper to mark them, the Society will pay the 4*d*. If an application be made to mark any cattle which the Markers find to be unsound or diseased, or under the value of 10*l*., the matter shall be made known to the President on or before the next club night, and he shall bring it before the Committee then present, who will decide whether or not such be accepted, and upon what terms.

"If the Markers knowingly mark any cattle that are unsound, and the same be proved against them, they shall forfeit the sum of 20*s*. And if any member shall apply to have a diseased one marked, and know the same, shall, on proof being made, forfeit the sum of 20*s*., and not be entitled to any benefit for the loss of such cattle.

"Should any marks wear out, the owner shall be under the obligation of paying to have the marks replaced, in order to avoid fraud and error; or in default thereof shall not be entitled to benefit, if on inspection no marks are discernible.

"10. No member of this Society shall have any relief from it if he or she wilfully neglect their cattle in not calling in a Veterinary Surgeon, or person skilled in the diseases of cattle, who shall be paid by the owner, at his expense; but if the cattle grow worse or become dangerously ill, the member shall give notice to the Steward, who shall go within eighteen hours after notice given, to view any cattle taken ill, or forfeit the sum of 2*s*. 6*d*. each; and, on viewing the cattle, if the Steward shall think any other V.S. more skilful than the one employed, they shall have power to order the owner of the cattle to employ the person they recommend; and if the owner do not as ordered, it shall be deemed neglect, and he shall not be entitled to any sum from the fund; but if care be taken, and such cow happen to die, the owner thereof shall receive from the Treasurer of this Society the sum of 10*l*., on producing a certificate signed by the Steward or Stewards; but the benefit arising from the sale of the diseased beast shall in every instance be paid into the box, and the Stewards shall have the sole right of selling such beast, and shall see such beast is slaughtered.

"11. If any member of this Society keep a cow so marked to old age, to be under the value of 5*l*., and the same happen to die, the Stewards shall allow the full amount, or only the real value, as they consider fair and just.

"12. No complaint shall be heard unless proved at the time such neglect shall happen, or, at least, before any claim can be made upon the Society for loss of cattle; and any member making any complaint afterwards shall forfeit the sum of 2*s*. 6*d*.

"13. When the fund shall fall short of paying the loss for cattle belonging to the members, it shall be lawful for the Stewards to make a rate to pay the money wanting, providing it does not exceed 1*s*. per cow, which rate shall be paid at the succeeding meeting, over and above the usual subscription, and every member refusing shall be excluded.

"14. Any member purchasing cattle of any description of any member of this Society, already marked, shall not be entitled to any relief from this Society except the same be viewed, approved, and marked again by the Markers of this Society.

"15. Any member parting with any cattle that are marked according to the Rules aforesaid, and buying fresh ones in their stead, if sound, and they pay the Markers for marking them, they shall be entered instead of those parted with, and shall be entitled to benefit immediately.

"16. If any member be found to have in possession more marked cattle of any description than has been paid for the preceding month or months, by the Markers of this Society, he or she so offending to be entitled to no relief from the Society, and to be excluded.

"17. If the Treasurer has not sufficient funds in hand to pay a member's claim for loss, the same shall be paid at the next monthly night.

"18. No member shall be allowed any benefit from this Society who has cows in this Club belonging to other people entered in his name.

"19. No member shall be allowed to dress his or her cattle with mercury or mercury water, or any injurious ingredient whatever: for if any cattle sustain any injury by such application, he or she so offending shall receive no benefit for any cattle so dressed.

"20. A Committee of eleven members shall be chosen annually, by a majority of the members then present, whereof the President shall be one, and all grievances or differences that may arise between members of this Society at any of their monthly or quarterly nights, shall be decided by a majority of the Committee then present; and if any member shall upbraid any of the officers or other members, either publicly or privately, concerning Club affairs, he shall, upon proof thereof, forfeit 1*s.*, or suffer such other punishment as the Committee shall think fit. Members refusing to serve on the Committee when elected shall be fined 6*d.*

"21. Any member who shall curse, swear, or otherwise behave indecently during business hours shall be fined 6*d.*

"22. A Calf Club shall be held in connection with this Society, and every person entering calves shall pay 1*s.* entrance, and 6*d.* per month contribution for each calf.

"23. No calf shall be entered before the 1st January, and shall not be entitled to any benefit from the Society until after the expiration of fourteen days from the time of entry, when they shall, in case of the loss of such calf or calves, on producing a certificate signed by the Stewards, receive from the Treasurer, if before the 1st of May, the sum of 4*l.*; and on and after the 1st of May, the sum of 6*l.*; providing that Rule 10, as far as regards calling in a V.S., giving notice to the Stewards, also selling of the beast in case of death, shall have been observed, otherwise no claim can be entertained.

"24. No calf shall be marked that is not considered by the Markers to be of the value given in case of a loss, as in the preceding Rule, viz.:—from the 1st January to 1st May, 4*l.*; and from 1st May to 30th December, 6*l.*

"25. Calves may be marked at any time into the Calf Club, after the 1st January, providing they be of the value laid down in the preceding Rule: but no calf or heifer shall, under any circumstances whatever, be marked into the Cow Club until they are two years old (*i.e.*, not before the 1st of January, the usual time of marking such calves or heifers into the parent Society).

"26. Any calf that has been marked into the Calf Club, and whose contributions are all paid up to the 31st December, shall, on the 1st January, be transferred into the Cow Club, providing such calf or heifer be of the value of 10*l.*, and shall be entitled to benefit immediately they are transferred; but should any calf or heifer so marked, and whose contributions are all paid as specified above, but which is thought by the Markers not to be of the value of 10*l.*, or is in any way diseased, so as not to be in a proper state to be marked, in order to transfer them into the Cow Club, the case shall be immediately brought before the Committee, and it shall be deemed lawful for them to accept such heifer or heifers at such a valuation as they may agree upon; and in case of the loss of such heifer or heifers, the owner thereof shall receive no more from the Society than the amount at which they were valued by the Committee at the time they were accepted by them. But

should such heifers afterwards attain to the value of 10*l.*, either by growth or recovery from disease, the same shall be inspected by the Markers, and, if approved of by them, they shall be re-marked, and at once be admitted to full benefit, and receive in case of loss the sum of 10*l.*, according to Rule 10.

"27. No Marker or other member of this Society shall at any time mark their own cattle, and any Marker or other member so doing, contrary to this Rule, shall not receive any benefit from this Society in case of the loss of such cattle so marked.

"28. The following salaries shall be paid annually to the officers of this Society for their services, viz.:—

	£	*s.*	*d.*
Secretary	4	0	0
President	0	10	0
Stewards (each)	1	0	0
Markers (each)	0	10	0
Chapel-cleaner (for cleaning Club-room and lighting fires)	0	5	0

"Such salaries to be paid on monthly Club nights in May of each year.

"29. The Committee shall have power to alter at any time any of the foregoing Rules if requisite; also to make and adopt any new ones they may deem necessary.

"30. Every member of this Society shall stand to and abide by these Rules; and any member opposing the same, contrary to law, shall be fined the sum of 5*s.*, or suffer such other punishment as the Committee shall think fit, which fines shall go to the box."

The names of the President, Committee, Markers, Trustees, Treasurer, and Secretary are here added.

I suppose there is not a better conducted or more successful society of the kind in the country than the "Bulkeley School Cow Club," and its rules may be taken as a model.

As this is an important branch of my subject, I may here insert another account of a successful cow-club, which I have received from the Rev. J. J. Pulleine, Kirby Minster, Thirsk, Yorkshire:—

"A club for the insurance of cottagers' cows was established in the parish of Kirkby Wiske, in the North Riding of Yorkshire, in the year 1844. With the exception of one disastrous year of cattle-plague, when it was temporarily suspended, it has continued its operations ever since. During the 35 years of its existence, 26 cows have died, for which compensation to the amount of 202*l.* has been paid, whilst the annual average number of cows on the books has been something over 25.

"Only once has there been a balance against the club, and at the present time its funds are flourishing.

"The area of the district is some 6000 or 7000 acres, including four small villages, in three of which there are small holdings of grass land, and allotment fields, whence a small quantity of roots and straw may be obtained. There are also green lanes, which, in times when no cattle-plague or other epidemic exists, afford pasture for the cottagers' cows in spring and summer.

"The amount insured is 8*l.*, and the premium 4*s.*, payable in half-yearly instalments, with an entrance-fee of 10*s.*, to be repaid to the insurer on his withdrawing, if the funds of the club warrant it. This scale is probably low for present prices, though sufficient for 35 years ago. In addition to this, a few neighbours are honorary subscribers of 5*s.* per annum. These subscrip-

tions have been a source of great strength to the club. At the present time, however, its finances are so good that the honorary subscriptions are not asked for.

"The following Rules are suggested as the result of some years' experience:—

"1. The district to comprise—[State names of parishes, &c.]

"2. The officers (to be elected at a general meeting of the Society) to be a President, Secretary, three Trustees, and one or more Markers, who will pass the cows to be insured, and mark them on the horn with the club's brand.

"3. The moneys to be deposited in the —— Savings Bank.

"4. Two classes of members.

"*Honorary Members*, paying a subscription of 5*s.* per annum.

"*Ordinary Members*, paying an entrance-fee of 10*s.* for each cow insured, and a premium of 2*s.* half-yearly.

"The cows to be insured for 12*l.* each.

"5. Any member withdrawing a cow from the club shall receive his entrance-fee back, or such proportion of it as the funds of the club warrant; but in no case shall he receive more than the amount of his entrance-fee.

"6. No member shall insure more than two cows.

"7. The premiums shall be paid at the general meetings of the club, on the first Mondays in January and July, when a statement of the club's finances shall be laid before the members.

"8. If at any time the club be dissolved, the money in hand, after repaying the entrance-fees to existing members, to be handed over to the nearest Agricultural Society.

"The above rules require very little explanation. The farmers would probably be glad to fulfil the duty of marking the cows, after having satisfied themselves of their soundness and value. Rule 6 confines the benefits of the club to *bonâ fide* cottagers only. Rule 8 is intended to check the tendency of country clubs to dissolve, when their numbers get low, and divide the spoil.

"The advantages of a local insurance club, such as is described above, cannot be easily overrated. It brings insurance home to the very doors of the cottagers, without the routine of forms of application and attendance at offices. It fosters a spirit of thrift and independence, and cuts at the root of the demoralising habit of carrying 'briefs' wherever a loss occurs. It is one of the links which still bind together the labourer and his employer or landlord. The chief requisites for success are energetic officers, in whom the members will have confidence, and a set of short, simple, and workable rules, such as those suggested above."

Answering my queries seriatim, Professor Sheldon, Sheen, Ashbourne, says:—

"I think it is best, as a rule, that the cow should be kept by the employer, as this does away with sub-letting or apportioning land to the labourer; a practice which landlords, as a rule, do not like their tenants to follow. Yet the labourer feels complimented by being allowed to hold a portion of land, when he is *tenant* of it; and this is best where it can be had.

"If a labourer keeps a cow in this district, he either pastures her on his employer's land, or on some one else's in the locality who may offer him better facilities. But it is only few labourers who keep cows in these parts, and some of them happen to have a few acres of land of which they are *bonâ fide* tenants.

"What food the cottager may purchase during the year for his cow will depend on what his land will do. In some cases a cottager has enough land to provide forage in winter, in which case he pastures his cow elsewhere, and mows his own land, as this is found more convenient than grazing his land

and buying forage. To eke out or improve his forage he will often buy millers' refuse and odds and ends, or he will look round for some cheap rice-meal or maize-meal, or anything else that happens to be cheap on the market.

"It is seldom that he will purchase manure for his pastures, unless it be a load or two of lime; but he will not uncommonly buy artificial manure for his meadow-land, to eke out the natural manure his cow and pig produce.

"Sometimes he buys litter, that is if he does not grow a bit of corn of some kind; at other times he will harvest rushes and sedges where they are available, and if he is at liberty to do so. But, as a rule, he uses no litter whatever for his cow, nor, indeed, is it necessary that he should, and he will want it for his pig if for anything.

"He will generally sell a little butter, using the skim-milk for food, and not unfrequently he will sell milk to neighbours. Sometimes he will make a little cheese in summer. In the one case he will use his butter-milk, and in the other his whey, for the pig.

"The extra buildings are merely a shed, which he will put up himself at a very light cost, thatching it with rushes or straw, or covering it with gas-tarred boards, or with any other material that may commend itself to him on the score of cheapness and efficiency. His ordinary pantry will serve as a milk-room.

"When his cow dies, he generally goes round to all the farmers within a couple of miles or so, and to others who can afford to help him, and people give him half-crowns, shillings, and sixpences. The clergyman, or some other capable person, draws up a short petition, and heads the subscription list.

"In one case that I am acquainted with, a tract of uninclosed land has been set apart for generations to pasture in common the cows of different persons, and the right of pasturage goes with certain houses. The right of pasturage for each cow is called a 'cow-gate,' and some houses are entitled to two, three, or four gates, and others to only one. A given rent per cow is paid, and the pasture accommodates a given number of cows through the summer. The forage for winter is procured from inclosed land bordering on the pasture. This land may at some time have been set apart as a reward for good conduct, but the rights are not rearranged on that basis. Some persons sell or sub-let their 'cow-gates.'

"The moral advantages, where a little land is held, consist in the labourer having a stake in the parish, and not being merely a lodger, as it were, in a cottage. It gives him a certain social standing which he values highly, and he feels himself to be a small capitalist. Having something that he regards with no little pride, he has every inducement to be frugal and industrious in order to increase his store. His interest in life, and in the affairs of the parish, is increased. He has more self-respect, is regarded more favourably by others, and is, perhaps, a thought more consequential. He has always something of his own to turn to, by which he can profitably fill up his overtime, and this keeps him out of the public-house. The moral advantages are probably more valuable than the directly material ones; for they give a better tone to his life than he would get from the same material advantages supplied to him in some other way; they give him an incentive to exertion in his spare hours, and keep him out of the mischief which is left for idle hands to do.

"But the material advantages are not inconsiderable. They enable him, if he has his land cheap enough, to live much cheaper and better than he could without them, and they enable his wife to take an important part in the struggle to live. This, indeed, is a great moral as well as material advantage, for the wife is something more than a mere companion; she is, in part, a bread-winner for the family. By the aid of a cow, a pig, and a good garden, a labourer can provide his family with nearly all the food they require except

bread; and if he has land enough to rear a calf every year, having thus an animal to sell annually, his position is not so dependent; he has always a something to fall back upon, and where he is in regular employment, and sickness does not invade the family, his life contains the chief elements of happiness."

Earl Nelson, who writes from Trafalgar, near Salisbury, has devoted great attention to this subject. I have been often asked how much grass-land fed and mown is required to maintain a cow summer and winter. Lord Nelson gives the following details in reply to the query on that subject:—

	A.	R.	P.		Rent. £	
(1*a*)	4	0	0	Half being water-meadow ..	14	
(1)	2	3	30	Including garden and cow-land, and generally accompanied by half an acre allotment for roots or vetches, at an additional rent	9	This is only pasture, and no cottage.
(2)	3	0	29		13	Including cottage, garden, and pasture.
(3)	3	1	13		13	Ditto ditto.
(4)	2	3	30		9	Only pasture.
(5)	5	0	38	This is a carpenter's	15	Including house, garden, pasture, and orchard.
(6)	5	0	32	This is my woodman	5	Poorer quality of land.
(7)	2	2	0	Both labourers	3	each.
(8)	2	1	0			

"There is a turn-out on the common, but it is not much good, being overstocked, except in one part."

The replies to the other queries are as follows:—

"I should think very little; but the cows are fed by roots grown on allotments and on the hay. Those who live near the Common have a summer turn-out; and those who can, keep a boy to tend them on the Common.

"They nearly all keep two cows, one coming on; and these with their pig seem to make enough manure.

"Dried fern is purchased from the woods.

"Sells all, except the skim-milk.

"The butter has a ready sale. They reckon the cow at 5*s.* a week gain. I doubt their putting their own labour as an outlay against this.

"A cow-house; two if put at the corner of two pastures may come under one roof, and of course some extra fencing, which has to be kept by the landlord in repair. This accounts for the high rent, as it causes a large outgoing. The rent also includes rates and tithe rent-charge paid by the landlord.

"Our cow-land people are all very anxious to insure their cows. My idea is to try and insure for all the cows as belonging, for this purpose, to a company in one insurance for all, as a farmer does, each paying their share, and the landlord perhaps subscribing also to encourage them, but at present I have not met with a company willing to take the insurance.

"The labourer's only title to cow-land thus becomes a reward on his own providence, as I profess to refuse to let a cow-land unless proof is given that the labourers have saved enough money for purchase of a cow, and I should certainly not knowingly let one to a drunkard.

"In the neighbourhood of the New Forest the old freeholder still exists to a certain extent; and until his cottage is mortgaged, he manages, with a cow or two and a pony, and a turn-out in the forest, to support himself during the winter, and in summer there is a body of labourers on the spot ready to

go out to harvest-work. The inclosure of commons has completely abolished the old freeholders in other places, and even where, as at Whiteparish, there is a common, their property generally gets in a disgraceful state, and their cottages go to ruin. My endeavour, by letting cow-land in the neighbourhood of villages, and large acre or two-acre allotments to tradesmen and wood-dealers, who have a horse, is to confer greater advantages than those of which the old freeholder has been deprived. It has a tendency to keep trade in the country parishes, and to keep labourers in them on the prospect of some day having a cow-land. As to moral advantages to the men themselves—

"(1.) It gives an encouragement to soberness and providence, as they may lose their land if they farm it badly.

"(2.) It is healthy for the family to have milk. I fancy I can pick out a cow-land child in a school from others.

"(3.) It employs the wife and eldest daughter without obliging them to work in the fields, which has a directly immoral tendency, insures an uncomfortable home, and wears out the clothes.

"(4.) It helps to teach the boys the care of cows and pigs and the milking of cows, and the girls dairy work.

"From my experience, it has acted very beneficially in unexpected ways at Whiteparish. The land was lately purchased of a ruined freeholder, and was completely worked out. Part of the cow-land was an old cottage-garden, grown to weeds; and they asked to plough it up, which was refused. They sowed clover, and that, and the rest of the grass-land, is wonderfully improved in the two years of their occupation. The woodman's pasture is twice as much manured, and looks twice as well as the same portions of the field let to larger tenants. The allotments of cow-land are loaded with manure. In one case, an old policeman, on a pension, has been enabled by the cow-land to pay 5*s.* a week towards the expense of a daughter as pupil-teacher, and asked for half an acre more allotment to keep another cow for a second daughter.

"In one case the man has died, and the widow and her son keep on the land, and have hitherto thereby kept entirely off the parish. In another, the water-meadow man, an old foreman and labourer, quite keeps his head above water."

Sir A. K. Macdonald, Bart., writes from Woolmer, Liphook, that milk is not readily obtainable in that locality, and that the few labourers who keep cows enjoy common rights which enable them to do so.

Earl Cathcart has been good enough to obtain the following replies from Mr. R. W. F. Mills, the eminent land agent of York, whose opinions on this subject are entitled to great weight, and are entirely concurred in by Lord Cathcart.

"It is desirable that a farm labourer should have a cow; milk is not otherwise readily obtainable.

"The cow should be kept by the man if he has land, by the employer if otherwise, and the cow should be the property of the employer in the latter case, and there would then be a deduction in weekly wages.

"The quantity of pasture allotted for a cow varies according to quality, but where he has a field or two the quantity is regulated by the size of the fields more than by the actual quantity required. From three to four acres may be taken as the average for summer and winter maintenance.

"The pasture is hired with the cottage, and from the owner of the land.

"The food purchased for the cow is a little linseed cake during the year.

"The cottager rarely purchases any manure.

"He obtains for litter a little straw from his employer, and the grass edges of arable fields, which are also given to him.

"He consumes a portion of milk and sells butter.

"The quality of the butter compared with that of larger dairies is equally good where the person who attends to it is of cleanly habits.

"A cow-shed will cost, with a piggery, 25*l.*

"No method of assurance has been adopted on estates that I am connected with. A man of good character will have many friends to help him in case of loss, but I approve of assurance."

Lord Cathcart notes here, "I have been a member of a cow-club for many years. We have a balance to credit."

Mr. Mills's answer to query 13 is—

"I have the management of estates where there is a pasture set apart for cottagers' cows, and also a meadow. A certain portion of meadow is allotted to each cottager, the after-grass is eaten in common within certain dates, and there is a fixed time for stocking the pasture. The extent of pasture and meadow is four acres, and the rent 8*l.* a year. The fields are near to the village, and the cowsheds and pigstyes are built in them and all together, and this plan I strongly recommend. Generally these buildings are placed immediately behind cottages, and are at variance with all sanitary views."

In reply to query 14, Mr. Mills says—

"Careful habits to obtain the means of buying a cow. Good conduct to obtain the land when a vacancy may occur, and good conduct on the part of the whole family resident in the village to retain it. A farm labourer is not of a migratory character when he can have his cow and his pig; and during the period such high wages were paid in the mining districts, those who had these privileges were the only men who could be relied upon as permanent labourers—the young strong men who did not possess them went away."

The Duke of Northumberland, having forwarded the queries to Mr. Snowball, his commissioner in Northumberland, I have received some interesting communications from that part of the country, as well as from the Duke himself. His Grace thus describes the change that has taken place: "Formerly every hind in Northumberland, if married, had a cow, and was allowed grazing ground for her by the farmer hiring him; latterly, however, I fear this custom has been on the wane, and going out with that of paying the hind in kind, once prevalent throughout the district." The result has been that, as Mr. Snowball remarks, "the keeping of a cow is the exception instead of the rule, which I much regret."

Mr. John Patten, farm bailiff to the Duke of Northumberland, writes "that the labourer ought not to be dependent on the farmer for milk; he should be the owner of a cow maintained by his employer." "The keep of a farm labourer's cow is regarded," Mr. Patten says, "as part wage, equal to from 4*s.* to 5*s.* per week. For this his cow has grazing in summer and

from 1½ to 2 tons of hay in winter." He buys no manure, but he "generally finds it profitable to supplant the hay supplied by the farmer, by the purchase of a moderate quantity of meal, or cake, during winter." The farmer supplies the litter. That portion of the produce of the dairy which is not consumed by the labourer's family is sold. Mr. Patten makes this sensible and practical remark on the quality of the butter: "Butter being oftener made in large dairies, the cream is not so long kept; hence the butter is a little sweeter than where the labourer's wife only makes it once a week, and in order to extract the last grain of strength from the milk perhaps allows the cream to stand too long on her dishes. Still, only the fastidious could detect the difference."

The cost of a byre for four cows is about 40*l*. Mr. Patten makes this reply to the query as to assurance:—

"Until within a few years ago, a cow-club existed in this neighbourhood, in which a farm labourer could insure his cow to the amount of 12*l*. by paying an annual subscription of 10s. After doing good service for about thirty years, this club was found at length unable to meet its demands, owing to much loss among cows. Hence its discontinuance."

This intelligent informant completes his replies as follows:—

"Any decrease in the number of cows kept by farm labourers is to be deplored, as it means a scarcity of the most natural and wholesome food and beverage; and the stalwart frame and ruddy countenance of the countryman is owing as much to this diet as to the pure air he breathes. Indeed, the benefit to a family where milk is freely used in the place of tea, coffee, and beer, can scarcely be overestimated. The keeping of cows also tends to habits of economy and thrift, the housewife being able to attend to the cow as well as to perform her household duties. Where good management exists this extra labour is amply repaid.

"From these cows a number of calves are produced, which is an advantage to the farmer, from having them bred at his door."

Mr. G. H. May, Elford Park, Tamworth, in replying to the queries, has written me an interesting letter on the milk-supply, which I hope to publish in another article. Writing on the same subject, Mr. James Howard describes a simple method by which he supplies the village of Clapham, Bedfordshire, with milk.

Mr. W. T. Carrington, Croxden Abbey, Uttoxeter, refers to the indifferent milk-supply, and thinks that some of the best farm labourers should have the chance of keeping a cow. He writes:—

"Three of my labourers keep cows, and all of them obtain from me, at moderate prices, linseed- and cotton-cake, &c., to supplement any deficiency in the quantity of their hay, and to increase the yield of milk and butter.

"The condition of these small holdings is generally good, owing to the consumption of purchased food by the cow or pig.

"A little nitrate of soda and superphosphate or guano are purchased for the pastures.

"The cow, tied up in a stall, requires little if any litter. Straw is in this district as dear as hay, and is only bought for thatch.

"Most of the milk is generally used for butter-making, the skim-milk being partly consumed by the family, and partly used in rearing a calf, or, with maize meal, in fattening a pig.

"The labourers' wives have in this district usually been in farm-service where dairy work has been done, and their butter is generally of average quality.

"The moral and material advantages of farm labourers keeping cows are the encouragement of thrift and increased attachment to the home.

"In districts suitable for pasture and the growth of hay, from 3 to 6 acres of grass-land attached to a labourer's cottage are much prized by industrious married labourers who have saved a little money. The labourer need not lose his daily wages, except for a day or two at mowing or haymaking. His wife looks after the cows, and is enabled to keep poultry—no mean advantage where well managed. The milk is of great use as diet where there is a young family. Children rarely look rosy and in robust health except where they get a good supply of milk. There is a decided contrast in the appearance of children in those districts where milk is abundant and those in arable districts where the supply is deficient.

"I supply all my labourers with as much pure new milk as they wish for the consumption of their own families at 2*d.* per imp. quart all the year round, and I think that the general adoption of such a system would improve the physical health of our agricultural youth.

"The children of a labourer who keeps a cow learn early to milk—a desirable acquirement. Few, except those who learn young, become good milkers.

"The plan of giving large allotments of arable land for occupation by farm labourers is undesirable, but very much more is to be said in favour of a small grass-land holding contiguous to the cottage."

Sir Edward C. Kerrison, Bart., Oakley Park, Scole, Norfolk, has favoured me with several valuable suggestions, but, as Sir Edward remarks, he resides in an arable district, and quite the wrong district for cow-keeping. The men do not understand the business, the women are not good dairy-women. A few cows are kept, but they are uninsured, and although in some districts uninsured cows, when they die, are replaced somehow by the losers, that would not be the case, I am afraid, in Suffolk. This is what would happen in some parts of England that I am acquainted with—if a man heard his cow cough in the night he would immediately rouse his wealthy neighbours, running to them with a "brief," i.e. a begging petition for raising a sum of money wherewith to buy another cow.

Mr. J. B. Lawes, of Rothamsted, resides in a heavy land locality, but the clays of Herts are not of the pastoral kind, the people are completely ignorant on the subject of dairying, and Mr. Lawes has declined attempting the introduction of cow-keeping on his estate. He writes:—

"The subject of cow-keeping by labourers was very carefully considered by

me some time ago, but given up as altogether impracticable. I always go to the Highlands every year, where every one has a cow. The cost of the cow, of her keep, and the position of milk as an important article of food are so totally different, that I fear the system could not be established here with any prospect of success."

Ability and grass are two indispensable preliminaries to successful cow-keeping by cottagers; and as both abound in the vale of Aylesbury, I was surprised to learn from Mr. John Treadwell, of Upper Winchendon, that none of the labourers in his immediate neighbourhood keep cows.

Mr. J. Gaitskell, Hall Santon, Holmrook, Cumberland, does not live in a neighbourhood where the labourers keep cows; but as the one example which he mentions is favourable to the practice, I think his letter will be read with interest:—

"I scarcely think it is desirable that the labourers should keep a cow where milk is obtainable, as it is in this neighbourhood. If not, I think it would be better to stipulate for a certain quantity with the farmer.

"The cow should be kept, if at all, I think by the employer, and even then it might lead to dissatisfaction and unpleasantness, especially as regards the winter feeding. Besides, I should find some difficulty in arranging for ten or twelve more milch cows to be with my own, and still more if they were to be provided for elsewhere.

"The only labourer who keeps a cow that I know of is at a high-lying farm of ours where young cattle are wintered, I finding him pasture and hay, for which his wife lets the cattle out and brings them up again."

On the question of moral and material advantages, Mr. Gaitskell says:—

"I do not see that it would tend to their moral, nor yet much to their material, advantage if an equivalent has to be given, especially where milk is to be obtained. If farm labourers generally had a cow each, I should be afraid of the land overflowing with milk at some seasons, without a ready means of disposing of the overplus, and at other seasons a dearth, when the farmers are not prepared to meet the emergency. Besides, if buildings, &c., were provided, all labourers' wives are not competent either to take charge of a cow, or to make the most of her produce; and if the labourer had to attend to her, it would be apt to interfere with his other work too much.

"Many farmers would, I think, find it inconvenient to give up a suitable pasture-field, with water in, for their labourers' cows; and to admit comparatively strange cattle amongst their own would tend to casualties, abortion, &c.

"It is no doubt not only desirable, but essentially necessary, that where there is a family of children milk should be provided for them; and that, I am inclined to think, could be done to the labourer's greatest advantage through the farmers of the neighbourhood.

"It may not be quite foreign to the subject to state that, after supplying their gardens with manure from their pigs, our labourers are allowed to plant potatoes with the remainder in the field, the ground being worked and the manure carted for them. Formerly there was no restriction as to quantity, but it became necessary to restrict them to 1000 yards. The weeding of these does not interfere with the labourer's time, costs him little or no outlay, and is in my opinion a greater boon than the cow would prove to the labourer,

especially where milk can be obtained. In the absence of *experience*, I have substituted *opinions*.

"The man I have named keeps his cow in capital condition. He obtains litter from the mountain pastures. He sells and consumes the produce of the dairy, and generally kills three pigs each year, two of about thirty stones each and one smaller. The quality of the butter compares favourably with that of larger dairies."

Numerous statements of practice and opinion have reached me from various parts of the country, which I am unfortunately compelled to omit through want of space. The general opinion of the good effect of cow-keeping agrees with that of Mr. Jabez Turner, Norman Cross, Peterborough, who says:—

"The moral advantages of a labourer being supplied with a cow by his employer are, in my opinion, a greater feeling of interest in the well-doing of the farm stock generally on the part of the labourer, and a somewhat stronger tie to a home where he has the privilege. On the part of his wife and family the results are very manifest in their increased industry and cleanliness."

Lord Vernon makes the following remarks:—

"In the dairy districts of Derbyshire the labourer has great difficulty in buying milk. When he has a small holding he seldom allows his children milk, but sells it as butter or cheese. The make of butter on farms is generally very inferior, not worse or better on the small cottage holdings. The advantages appear to me to be that a labourer and his sons have an interest in remaining at home from day to day; and that by good management and thrift they may save money and gradually raise themselves. I have known such instances, but they are very few. The labourer oftener than not has an insufficiency of capital to start his small holding. The actual result is, that when his stock dies he appeals to the charity of his neighbours. I believe that many who make cheese sell it at whatever price the factor who calls on them chooses to give them. They do not take the benefit of selling in the open market. A material difficulty in dealing with this question is when the labourer dies, leaving, as is often the case, a widow incompetent to carry on the farm. She is always anxious to remain, and there is very great difficulty in removing her. She and the members of her family consider that they have a moral right to remain."

The Earl of Powis, Powis Castle, Welshpool, Montgomeryshire, has greatly aided my inquiries. He replies to queries from Walcot, Lydbury North, Shropshire:—

"It is the greatest boon that can be conferred on a labourer who has saved some money. Milk is never readily obtainable. It does not pay to sell milk in small quantities; butter is more profitable. It is best for the cow to be kept by the man. The grass-land required is 2½ or 3 acres, according to quality. In Salop and Montgomeryshire, on land worth 30s. an acre, 2½ acres would suffice. The house, garden, and pasture form one letting. It is hired from the owner of the land. The cottager generally buys no food for his cow. He probably grows a few turnips or mangolds in his garden. He buys no manure; he has only what the cow and pig make. The butter is generally better than farm butter. There is no difficulty in selling it. The building must be big enough to hold a cow and a calf, with a small hay-bay, say, 15 feet by 7 feet, costing, according to materials, from 15*l.* to 30*l.* It is also a great advantage, in promoting the health of the children, to have

plenty of milk. It tends greatly to keep the labourers on the farm. They never like to lose a place where they have a cow."

On one estate of the Earl of Powis, near Montford Bridge, Shropshire, I saw the system carried out with great success. In the course of a long walk with Mr. Bowen Jones, of Ensdon House, who farms 800 acres on this estate, and with Mr. Davison, the estate bailiff, we visited many of the cottagers, walked over their pastures, and looked into their cow-sheds. There are 57 small cow-takings on the estate. Several of the labourers on each farm are provided with a cow. The butter is collected and carried to market by certain members of the community, who act as dealers or agents. We called, for example, at the house of a widow, and found it locked; the son had not returned from work, and the woman was away with her donkey and cart, selling butter in Shrewsbury.

A certain amount of inconvenience arises from the occasional absence of the men. A cow or calf has sometimes to be sold, and the hay must be gathered once a year. There are some mowing pastures at a distance, on the banks of the Severn. The hay is secured in large cocks, according to the custom of this district; but it must be carted home by loan of the employer's horses. Mr. Bowen Jones admitted that favours must be sometimes asked and granted, and the "commercial system" set at naught to some extent. He and his uncle had supplied litter gratis, for example, to their farm-bailiff during his forty-five years' service, and he does the same for the bailiff's widow and her son (the stockman), who keep 2 cows, and hold 5 acres of grass. A man will sometimes be away at Shrewsbury on his own affairs, which would not happen if he had no cows, nor other property; no damsons, which pay the cottage-rent hereabouts sometimes; no money, hope, satisfaction, nor responsibility, except what he might derive from the 20 small rods of garden ground which, with a mean cottage, has too often been the hard-and-fast boundary of a labourer's home. A farm labourer without a cow or anything particular belonging to him or attainable except a large and badly dieted family, will soon acquire an ill-conditioned mind. Mr. Bowen Jones is aware of this. I looked in at the village school, and saw a roomful of children who have *not* been deprived of their bread and milk! I saw some of them driving the cows home to the byres, and learning early useful lessons of care and kindness to stock. I saw the meal-tubs filled with ground corn. I observed the admirable condition of the pastures and fences, and, in some cases, the permanent improvements which have been effected by the cow-keepers. I observed the store of

bacon hanging in the kitchens, the good manners of the children, unconstrained, and free from that objectionable servility which may be observed in some localities; and I concluded that the labourers on the Earl of Powis's estate must be living under favourable circumstances.

Mr. Bowen Jones thoroughly approves of the system. Mr. Davison remarked, in answer to a question of mine, "Two of my men are away to-day, as it happens (with permission, of course). I could not well spare them, but I would not refuse them; and, after all, the total amount of inconvenience is very small—not to be named in comparison with the advantages."

Some land on the river-side is let to cottagers here, and the particulars may be worth notice by those who desire to devote a field to their labourers, and to save fencing. They are as follows:—

"Lands called Horse Parks, in Shrawardine parish, containing about 23 acres. Rent 32*l.*; about 28*s.* an acre. Rates and tithes paid by landlord.

"Let to 16 cottagers, who pay 2*l.* each.

"Two stewards are appointed annually, who arrange the management of the lands.

"A day is fixed for the fences to be repaired, and each tenant has to attend on that day, or find a substitute.

"A day is fixed for mowing the grass, and all the tenants have to attend on that day, or find a substitute, or forfeit 11*s.*

"All have to make the hay, and it is made into large cocks of equal size, and lots are drawn for it.

"The hay is carried by the farmers to the cottagers' cow-houses. Each tenant turns a cow in to graze the lands.

"They do not put any manure on the land; it is generally flooded every year by the river Severn, which leaves a deposit."

The following rules and particulars refer to some land in Shropshire held conjointly by several tenants, and belonging to Lord Windsor:—

"Helmsley Meadow, Bromfield parish, containing 15¼ acres, occupied by 5 tenants, each having 3 acres of land, for a cow only.

"The field is divided into two equal parts by a post and rail fence, having the public road at one end, and gates to each part from the road.

"Five cottagers pay 6*l.* each = 30*l.*, free of rates and tithe (15 acres, at 2*l.* an acre).

"Each of the two pieces of land are mown and grazed alternately, and are equally divided into 5 parts, marked out by strong short pegs, numbered 1 to 5. Lots are cast, and each one takes that which falls to him.

"Each gate is kept locked, and each tenant has a key.

"A mole-catcher is employed to kill the moles, at 2*s.* 6*d.* a year, and paid by each tenant, at 6*d.* each.

"Each tenant acts as bailiff in rotation, yearly, and keeps the fences in good repair, and pays the cost of such. After so doing he charges and collects from each of the other tenants one-fifth part of such expense. But no bailiff is to incur additional expenses beyond the repairing of fences and mole-catching without the knowledge and consent of the other tenants.

"No horse is allowed to be put into the pasture.

"If any tenant should be without a cow he is not allowed to take in a strange cow, as underletting his part; but if any of the others are rearing a calf from their own cow, providing the two agree, and the others do not object, the calf may be entered instead of the cow.

"No cow to be admitted without knobs on the horns.

"Each tenant to keep his cow out from the pasture from the middle of April to the middle of May, to allow the grass to spring.

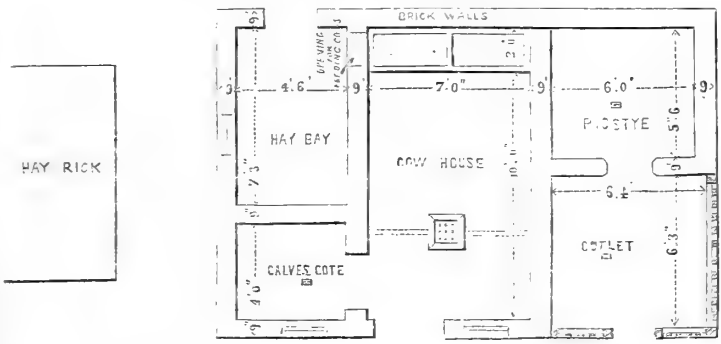
"Each tenant to put on to his lot for hay, the manure made from his cow every season.

"No tenant is allowed to mow any part that is being grazed for the season; but each tenant to cut and keep down the thistles, &c., on his own lot before they seed.

"A barren cow to be kept out from the field during the time she is uneasy and troublesome to the others."

One of the best cow-houses I have seen is shown in the accompanying plan of a cottager's cow-house and pigsty (Fig. 3), as erected in Shropshire, on the estate of Lord Powis. The cost, including materials and labour, and excluding cartage, which is done by the farmer and would cost about 3*l.*, is 38*l.* 14*s.*

Fig. 3.—*Plan of Cottager's Cow-house and Pigsty on the Estate of the Earl of Powis, in Shropshire.*



The walls of the building are of 9-inch brick work, in mortar. The floors are paved with hard burnt bricks, and proper drains are laid, the bed of the cow-house sloping to the drain grate, as shown on the plan, and the pigsty outlet and calves' cots sloping to the centre, where 8-inch drain grates are laid.

A sewage tank a few yards from the cow-house receives the liquid, which is used on the grass-land. The windows in the cow-house and calves' cots are of the kind termed hit-and-miss ventilators, consisting of wooden bars, or laths, fixed 2 inches apart vertically over the opening, with similar bars framed together, and made to slide on the inside, so as to regulate the ventilation. The window opening in the gable-end wall, next

the hay-barn, is for pitching hay through. It is fixed high up and fitted with a shutter. The outlet to the pigsty is inclosed with timber palings. The door-frames, wall-plate, and posts to the pigsty outlet are of oak, the door-frames have iron dowels at the bottom, which are inserted into stone plinths; the doors are of red deal. The roofing timber is of larch covered with 16-inch by 10-inch Bangor slates. The bricks and draining pipes are made on the estate.

During a drive with Mr. Haste, agent to Viscount Hill's estate at Hawkstone, Shropshire, I was astonished at the number of small holdings. Since many of them are in tillage, they must not be described here, but I mention them to show the good effects of established custom, for Mr. Haste assures me that those men who farm from 20 to 50 acres, and cannot all keep a plough team, help one another all round, and work on a smooth well-ordered system of give and take without disagreement. In Dorsetshire, on the contrary, Mr. Pope reports disputes between farmers and their men on such a miserable matter as a little straw for litter, and the cow-keeping broke down in consequence of these quarrels.

At Hawkstone, there are 360 cottages rented direct from the proprietor, with gardens of about a quarter of an acre, and 30 cottages hired of the farm-tenants, and there are in each category numerous cow-pastures attached to the cottages. They are all held under short notices—one or three months—which have been very rarely enforced. These smaller holders are farm labourers; many of the others, holding more land, are tradesmen and artisans employed on the estate, or persons of the class of small village traders, carriers, and professional labourers, who do jobbing work, such as thatching, hedging, and ditching, draining, mowing, bark-peeling, and other kinds of task-work, in gangs. They are men superior and more handy than the ordinary day labourers of the farm, and they find in these small occupations the additional sources of income which they require.

The circumstances here are exceptional, and I should quit my subject to explain them in detail; but I may say that small holdings, which would, if they were general, increase the number of paupers, have, with the cow-pastures, and with numerous outlets for the surplus population, almost entirely depauperized this estate. The aged are maintained by their relations, and, at present, there is not one old person from this estate in the union. The poor law is administered leniently. Two old persons, each receiving a little relief, sometimes occupy the same cottage, with a big garden of $\frac{1}{4}$ or $\frac{1}{2}$ an acre, which they make profitable by means of hired labour, or sometimes by sub-letting the land! A proprietor seeking informa-

tion on the depauperizing of his estate by cow-keeping and other means will find some useful hints on a property of this kind, though it may not be administered on the strictest rules of political economy.

Mr. Haste informed me that the cow-keepers purchase maize-meal and bran, and hay occasionally in bad seasons. They use bone-dust on their pastures. The produce, when one cow is kept, consists of butter for sale, and "skim cheese" for home consumption. The quality of the butter is, in many instances, superior to that from the larger dairies. "Cow-briefs" are unknown. The rules of a very successful cow-club on this estate have appeared in the form of a small pamphlet published by Mr. Franklin, Wem, Salop, and entitled "Rules of the Prees Cottagers' Cow Club, established 1838, and now held at Prees Lower Heath School." The society was duly registered by Mr. John Tidd Pratt, Registrar of Friendly Societies. The payments of the members are very small, 2*s.* entrance money, and 1*s.* per quarter, the stewards to allow a member whose cow dies a sum not exceeding 10*l.*,—the hide and carcass to be at the disposal of the committee. In buying a cow a warranty is required from the seller, and the animal must be on the premises forty-eight hours before she is marked as a club cow. Calves are insured at 1*s.* 3*d.* entrance fee, and 9*d.* per quarter, entered and marked old; all at 6 months owed for in the event of death at the rate of 2*l.*, if it die under 12 months old; or after 12 months, 3*l.* till bulled. An extra call is made when a loss is not met by the money in the box. There are honorary members.

I must sum up briefly the capital replies of Mr. George Willis, Duddon, Tarporley. He says that Cheshire, being a dairy county, farmers as a rule are very unwilling to sell even a small quantity of milk, and he therefore thinks it desirable that every labourer should keep a cow. Three acres of grass are sufficient, two acres of which are grazed, and one acre well managed for mowing. The cow-keeping labourer usually purchases about a ton of turnips or mangolds, and six or seven sacks of Indian corn-meal. He sometimes applies a top-dressing of bones. He purchases litter from his employer. His family consume a portion of the produce; and "as farm labourers here," says Mr. Willis, "generally marry farm dairy-servants who understand the manufacture of butter, the quality compares favourably with that of larger dairies." Mr. Willis adds:—

"The most thoughtful and intelligent agriculturists in this district agree that the moral influence is decidedly good and elevating. The children of labourers having cows, being trained while young to habits of carefulness and management, generally make the best and most careful farm servants. A good supply of milk is exceedingly valuable in the rearing of his family and providing the labourer himself with a strong and healthy article of diet, which

may be cooked in a variety of ways. The buttermilk assists him greatly in feeding a few pigs to supply the wants of his own family, or, if sold, in purchasing other necessaries. I know that where good judgment is exercised in the purchase of a suitable cow, followed by good management on the part of the labourer's wife, the financial result, in some instances, is very advantageous indeed."

I cannot conclude this paper without a brief reference to certain arguments—errors I should like to call them—used by some of my correspondents who are hostile to cow-keeping by labourers. They say that the cow must become, they fear—though they rarely, if ever, speak from experience—a cause of peculation, and that she must tend to engender feelings of suspicion in the mind of the employer; and they say, moreover, "Of course where a cow is kept less money-wages will be paid."

It is quite true that cow-keeping by farm labourers may, under bad management, resolve itself into a branch of the perquisite system. Some years since, when staying at Cardigan, I observed numerous small plots of pasture attached to most of the farms in the neighbourhood, and let to the labourers by the occupiers of the farms at extortionate prices. The farm-tenants having sole control of the supply of land, the cow-pastures were, in fact, allowed in part payment of wages. A more vicious form of the perquisite system can hardly be conceived; but such a flaw is not necessarily incidental to the keeping of cows by labourers. The tenants, on all the estates that I have mentioned in this article, pay the current wages of their neighbourhoods.

As to feelings of suspicion and peculation, neither the one nor the other ought to exist; and, if they do exist, a well-established system of cow-keeping by the labourers will remove both these evils. A great proprietor, on succeeding to his estate some years since, called the labourers together and addressed them in these words: "I am sorry to say, my friends, that most of you are as bad as you can be;" and he named peculation among the crimes that had been proved against them. They had not kept cows, but it was a cow-keeping district; and the landlord, after assuring his audience that the past should be forgotten, included a good house and a cow-pasture among the benefits which each labourer should enjoy for the future, until the same were forfeited by a criminal act legally proved. Hardly one man on that estate has since been convicted of a crime. I have seen the oil-cake, bran, and maize in sacks and casks, purchased by the cow-keepers on that estate, but as for the peculation, when I mentioned that subject to the employers it was declared to be a thing quite unknown. Farm labourers may have been incendiaries in some cases, some years since, and in some localities they may be thieves; but if that be the case, their

education and position must be defective, and they must sorely need the reforming influence of cows and pigs and good big gardens.

I have now set before the reader various examples of cow-keeping, and several suggestions for increasing the milk supply in villages. I have quoted the opinions of a large number of correspondents, and I think the reader will conclude from the evidence laid before him—(1) that the milk-supply to labourers and their children is at present exceedingly deficient; (2) that the labourer has in many cases become indifferent to the use of milk, even for his children; (3) that efforts should be used to revive the use of milk; (4) that cow-keeping by labourers should be encouraged in suitable districts, and that cow-keeping is a system which may be taught, and which prospers best when several cow-keepers live near one another, as, for example, on the estates of Lord Tollemache or the Earl of Powis.

XX.—*Notes on a Report by Victor Drummond, Esquire, on the Foreign Commerce of the United States for the fiscal year ended June* 30, 1878. *Washington*, January 18, 1879. By J. D. Dent, of Ribston Hall, Weatherby.

From this Report, which has been recently presented to Parliament, it is clear that the time of despondency in the United States is passing away, and that a revival of prosperity has commenced.

Up to the end of 1877 and during the earlier portion of 1878 severe distress prevailed in the United States, while depression and failure in most branches of business threw many thousands out of employment. The first symptom of returning prosperity was that many persons who were thrown out of profitable employment in the Eastern States turned their attention to Westward emigration, and to the cultivation of the soil. Mr. Drummond thus writes of the years 1877 and 1878:—"The soil, its cultivation, and its products have been yielding to the fullest extent their fruits during the last two years, producing a very large surplus. Agricultural labourers have everywhere found full employment. The transportation of their crops, and of the goods returned in place of them, has given increased employment to the vessels upon all the lakes, rivers, and canals, the railways, and to all the labourers in the business of transport." And he further states, as an indication of the "approach of better times, the prosperity

of the vast class who till the soil, and the changing character of the industries of a large number of persons as indicated in the increased amount of land taken up for actual settlement." At the time when the American agricultural class, aided by most favourable seasons, had thus made a fresh start in success, the British farmer had a series of causes working against him which were trying his courage and his patience most severely. While in America wages were falling to a very considerable extent, in England the wages of agricultural labourers were making a rapid rise, and the prices of agricultural produce, which had undoubtedly arrived at an unexampled height, fell, although successive unfavourable seasons most seriously reduced the produce of the United Kingdom. Mr. Drummond writes :—"The British workman must, like the American workman, accept the inevitable for a time, that is, accept a moderate wage until there is a revival of trade; those who will not do so must use the workmen's safety-valve—emigration. Employers will have to be satisfied with small profits from cheaper and purer goods; the labourers with smaller wages and longer hours in some cases, and shorter hours in others. Every one must economise."

In the meantime we must remember that every successful cultivator in the Western and Southern States of America becomes a liberal purchaser of our manufactures, and having no protection for his own industry, is anxious to receive imported goods as cheaply as possible; and when once the consuming population is fully employed, we may look with less anxiety to the future of our own agriculture.

Mr. Drummond reports, "that the total area of wheat fields in the United States may be put at 30,000,000 acres, or a surface nearly equal to the whole of England. The States that count acreage by millions are Pennsylvania, Tennessee, Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, and California. These States last year represented three-quarters of the wheat area; this year they will aggregate about four-fifths. The greatest proportionate advance is west of the Missouri, in Kansas and Nebraska, where the increase is more than 500,000 acres. The increase of Iowa represents a still larger area. Minnesota is credited with another 500,000, and Wisconsin and Illinois, together, with somewhat more than another 500,000. The increase is heavy in California, Indiana, and in a less degree in Ohio and Michigan. The advance is largest in the spring-wheat region. Farms of two or three acres are becoming more numerous in New England. In exceptional cases in Maine, New Hampshire, and Vermont, 40 to

50 bushels per acre have been obtained. The average yield ranges from 20 bushels in a poor crop to 30 bushels in a large one; the average yield for the United States is, however, 13 bushels and a fraction.

"The increase of production from 1849 to 1877 in the three great divisions is shown in the following table :—

Sections.	1849.	1859.	1869.	1877.
	Bushels.	Bushels.	Bushels.	Bushels.
Atlantic Coast ..	51,657,020	53,294,137	57,476,371	64,344,800
Central Belt	43,522,646	94,458,609	140,877,070	147,890,000
Trans-Mississippi	5,306,278	25,352,178	89,392,185	152,860,000
Total ..	100,485,944	173,104,924	287,745,626	365,094,800

"The wheat crops this year (1878) have given, it is estimated, 422,593,000 bushels. The average price per bushel of wheat in 1877 was 1 dollar 8 cents, market price, and export price, 1 dollar .169 cents.

"The crop of oats in value exceeds that of wheat, standing next to maize in quantity of product, and exceeding annually 100,000,000 dollars in value. Its cultivation has received a great impetus in the South, and farmers are learning to take advantage of the exigencies of climate, obtaining the principal growth in winter and harvesting early, at the same time selecting carefully acclimated and hardy varieties, popularly known as rust proof. There is an increase in area this season of one-tenth, mostly in the West and South. For 1878 the produce of oats was estimated at 411,854,000 bushels."

In the year 1877, 332,742,864 acres of land were devoted to the growth of maize, yielding a product of 1,342,558,000 bushels, at a price of about 36 cents per bushel. For 1878 the crops were estimated at 1,371,606,000 bushels.

The yield of barley had increased from 26,295,400 bushels in 1870 to 34,441,400 in 1877; and an estimated crop for 1878 of 42,222,000 bushels. The price in 1877 was nearly 64 cents per bushel. Of this grain California produces about a third of the whole crop, New York comes next, and these with the States beyond Lake Michigan make up four-fifths of the product.

Of potatoes, the crop in 1870 was 114,775,000 bushels, from 1,325,119 acres, valued at 72 cents the bushel; in 1877, 170,092,000 bushels, from 1,792,287 acres, valued at 45 cents

the bushel. For 1878 the crop was estimated at 124,027,000 bushels.

There was not any appreciable increase of acreage devoted to cotton in 1878, the amount being 12,056,855 acres in 1877, and 12,266,785 in 1878; but the yield for 1878 was estimated at 5,200,000 bales in 1878, as against 4,000,000 in 1877. The average of all bales received at Liverpool for five years is estimated at 450 lbs. of lint; the weight calculated last year in the agricultural department was 460 lbs.

There is also an increasing cultivation of jute in the Southern States, especially in South Carolina, where some of the planters are substituting jute for rice.

The 1878 crop of tobacco was secured under exceptionally auspicious conditions, yielding, it was said, about 410,000,000 lbs.

The vast area of land capable of producing cereals, and the proportion of production to population, in Mr. Drummond's opinion, prevents any appreciable rise in price arising from the exportation of these articles; but the foreign need of live stock, fresh beef and mutton, salt beef and pork, lard, cheese, and butter, is exercising a much greater effect in appreciating prices.

"Great attention is now being paid to dairying in the United States. The total number of milch cows in the different States in January 1878 was 11,300,000, valued at 298,499,866 dollars, or 62,187,472*l.*

"The value of the annual production of cheese and butter is estimated at 300,000,000 dollars, or 62,500,000*l.* The production has increased 33 per cent. within the past year, and since the introduction of the American factory system in the manufacture of them, they have become important objects of export, the foreign sale amounting during last season to 13,000,000 dollars (2,708,333*l.*) for butter; and 14,000,000 dollars (2,916,666*l.*) for cheese. The exporters this year have paid more than 1,000,000 dollars (258,333*l.*) for freight, or enough to support a weekly line of steamers to Europe. They have paid 5,000,000 dollars (1,041,666*l.*) freight to the railroads of the country, and milk pays nearly as much more.

"The dairying interest is one of vast and increasing magnitude. Its rapid growth in the East will be equalled and surpassed in some of the States of the West. In 1840, in the great dairying State of New York, the entire dairy product, including milk, butter, and cheese, in value amounted to a little less than 10,500,000 dollars, and in all the States to about 34,000,000; but in 1869, according to the Census of 1870,

the milk and butter produce of the State of New York alone reached the value of 57,000,000 dollars, and, including milk, 100,000,000 dollars. In the city of New York, in 1876, the total value of milk, butter, and cheese, received, according to the daily reports of the Board of Trade, was over 55,500,000 dollars, while in the single dairy product of cheese, the State of Illinois increased her yield sevenfold between 1870 and 1874. There are now important dairy districts in all parts of the South, and there are indications that the northern cities will soon be supplied with fresh grass butter throughout the whole winter from Mississippi, Tennessee, and other regions, where before the war the growth of grass was regarded as an impossibility."

Mr. Drummond's Report as to the production of meat, whether dead or alive, and the conditions under which it can be exported, is, I regret to say, very meagre, being confined to the tables of exportation during the years ending June 30, 1875 to 1878 inclusive:—

Products.	1875.	1876.	1877.	1878.
Animals Living.	Dollars.	Dollars.	Dollars.	Dollars.
Hogs	739,215	670,042	699,180	267,259
Horned Cattle	1,103,085	1,110,703	1,593,080	3,896,818
Horses	242,031	246,964	301,134	798,723
Mules	356,828	224,860	478,434	501,513
Sheep	183,898	171,101	234,480	333,499
Provisions.				
Bacon and Hams	28,612,613	39,664,456	49,512,412	51,752,068
Beef, fresh	..	..	4,552,523	5,009,856
Beef, salted	4,197,956	3,186,304	2,950,952	2,973,234
Butter	1,506,996	1,109,496	4,424,616	3,931,822
Cheese	13,659,603	12,270,083	12,700,627	14,103,529
Lard	22,900,522	22,429,485	25,562,665	30,014,524
Meats preserved	735,112	998,052	3,939,977	5,102,625
Mutton, fresh	..	..	36,480	9,272
Pork	5,671,495	5,744,022	6,296,414	4,913,657

The United Kingdom is the principal customer for this agricultural produce, although a considerable portion of the hogs, horses, mules, and sheep go to the West Indies, Central America, and Japan; and of salted and preserved provisions the West Indies take a good share.

Undoubtedly this Report presents to us a wonderful account of the prosperity and the productive power of American agriculture; and of the vast resources which the United States possess

to enable them to supply not only their own people, but the Old World with food. At the same time I cannot imagine that there is any need for our own agriculturists to be in despair. The very question of freight alone, according to Mr. Caird's calculations, exercises an influence about equal to the rent of our English soil. The great depression in American trade is only just ceasing. Mr. Drummond remarks in the same Report, "All these things point to a change for the better in the condition of all classes, and after resumption of specie payments is a real fact, success and confidence will be felt by capitalists, their money will be again forthcoming for new undertakings. This will further a distribution of higher wages and a consequent diminution in the number of those who are now working for starvation wages; for, in spite of the brighter state of affairs in trade, there are many workmen in the large cities who accept just enough of salary to keep them alive, hanging on in the hopes of better times and a consequent rise in their salaries.

"The large cities and towns are overcrowded; for every hand working in a mill there are a hundred ready to work for a minimum wage. The panacea, as a relief to this condition of things, must partly be afforded by the mechanics themselves, who must many of them emigrate to the agricultural districts."

For some few years lately the conditions of labour in the United States and in Great Britain have been reversed. They have had a superabundance of cheap labour; with us it has been scarce and dear. Their consuming powers have been seriously impaired, and ours recklessly indulged. The mechanic and the artisan have been obliged to take to agriculture in America, while our country districts were depleted of their best bone and sinew by the coal and iron trades. Beef and mutton have been at so high a price, that our dairy farmers have neglected the natural produce of their country, and have allowed themselves to be surpassed by France in the production of fresh butter, and by America in the quality of cheese. Men gave up breeding cattle, trusting to Ireland to produce lean stock to be converted into high-priced beef in England. Meanwhile, the quality of our manufactures in too many instances has deteriorated, from excessive competition; and trade, which had been unnaturally stimulated by speculation and rash credits all over the world, fearfully collapsed. Steamship owners, having no other freight to carry, threw themselves zealously into developing the American live-stock trade, and, tempted by high prices in England and reduced consumption in America, this business has been largely increased. But even now, in spite of the importation of American beef and the most terrible depres-

sion of trade ever known in England, the prices of beef and mutton have not been sensibly reduced to the consumer, while the prices of lean cattle for grazing have given way but little, compared to the prices of fat stock. The English agricultural labourer, as well as the artisan, has become a consumer of meat, and neither of these classes will give up the consumption, if they have the means to obtain it. The supply of good fresh butter and of dairy products is still notoriously indifferent, not only in our great cities but in our small towns and villages. In France and Switzerland the traveller almost universally meets with butter which tempts him to eat it, and with a profusion of good milk, if not of cream. The traveller in England too often, especially in small country towns, turns from his butter in disgust, and in vain desires a good draught of milk. The children of the poor in our villages, as well as our towns, do not get half the quantity of milk that is desirable, and, from childhood to manhood, are driven to tea, coffee, or stimulants, for want of the most wholesome and nourishing beverage. Our stock of cattle has diminished from the effect of high prices of beef and mutton. Prices may, perhaps, not in future range so extravagantly high; but for both dairy farmers and those who can breed and feed their own stock there would yet appear to be no serious difficulty, if the present crisis do but teach the required lessons. With returning prosperity to our manufacturers, the demand for the animal products of the farm must again revive, and the produce of the dairy and the poultry-yard will be found no mean adjunct to the rearing and feeding of cattle and sheep and the growing of corn.

PS.—Since the above notes were put in type, Mr. Drummond has published the following additional information, which may be usefully reprinted as an Appendix to them.

"WHEAT.

"*Lowest and Average Prices of* WHEAT *on board at* NEW YORK, PHILADELPHIA, BALTIMORE, *and* BOSTON, *and landed at* LIVERPOOL *first half-year*, 1879. *The dollar is equal to* 5*s*.

"Lowest price per bushel on board at New York, 1 dol.; at Philadelphia, 1 dol. 6 cents to 1 dol. 16 cents; at Baltimore, 1 dol. 6 cents; at Boston, 1 dol.

"Average price per bushel of red winter: On board at New York, 1 dol. 12 cents; at Philadelphia, 1 dol. 11 cents; at Baltimore, 1 dol. 6½ cents; at Boston, 1 dol. 6 cents.

"Average price per bushel landed at Liverpool: From New York—common wheat, 1 dol 17 cents; red winter, 1 dol. 24 cents; from Philadelphia—red

winter, 1 dol. 18 cents; from Baltimore, ditto, 1 dol. 27 cents; from Boston, ditto, 1 dol. 21 cents.

"Average freight per bushel: From New York, 6*d.*; from Philadelphia, 3¾*d.* or 7½ cents; from Baltimore, 6¾*d.* to 7*d.*; from Boston, 7½*d.*

"The average price of red winter wheat per quarter landed at Liverpool is then as follows:—Landed at New York, 41*s.* 4*d.*; landed from Philadelphia, 39*s.* 8*d.*; landed from Baltimore, 42*s.*; landed from Boston, 40*s.* 4*d.* We here observe that wheat from Philadelphia is landed in England at a cheaper rate than from the other ports. The low freight from Philadelphia is the principal cause, and this arises from that progressive city reaping a large share of the trade to Europe. From the 29th of July to the 4th of August over 1¼ million bushels, or more than four times as much as during the same period last year, has been shipped. This steady increase in the grain trade requires a large fleet of ships, chiefly British, which are now flocking to the port of Philadelphia. From information which has reached me, I am led to believe that under certain conditions wheat can be delivered at Liverpool from Philadelphia, with a margin for profit, for 35*s.* a quarter. It is not probable that this will happen, but I mention it as a remote possibility, although it would not be a lasting one.

"The total spring wheat acreage sown this year in the United States was four per cent. greater than last year, and the increase will no doubt be as great each successive year until there are symptoms of no profit in this direction. The yield in the one great wheat State of Minnesota for this year is calculated at 40,000,000 bushels; this is calculating that in two-thirds of its wheat area, 1,900,000 acres, there will be an average yield of 13 bushels per acre; and in the rest of the area, 600,000 acres, the yield will be 17 bushels per acre. The cost of wheat per acre in the great wheat-growing States averages 20*s.* per quarter.

"It is a very different thing in the North-Eastern States, where the farmers are handicapped as ours are by the extraordinary low freight charges from the Western States. Again, their farming is carried on partially under the same conditions as our own; they have the advantage, however, over ours by generally having good-sized orchards, which in a good year bring them in a fair revenue.

"THE CATTLE TRADE.

"Now, with reference to the cattle trade between England and the United States, I am enabled to supply some very important information kindly furnished me by those who are an unbiassed and reliable authority.

"New York.—The 'prime' beef, wholesale price, has ranged between 9 and 10 cents (4½*d.* to 5*d.*) per lb. For the common quality the price has varied between 7 and 9 cents (3½*d.* to 4½*d.*) per lb. since the 1st of January last. Beeves shipped 'alive' to Great Britain will average to cost about 5 dols. 70 cents per 100 lb. gross weight. The best grades cost more than this, and the fair grades less. The dressed beef, 'shipped in quarters,' costs from 8 to 9 cents (4*d.* to 4½*d.*) per lb. on board in New York; but prime live cattle, for which quotations are made, command, on slaughtering, a better price than ordinary refrigerated meat. The average weight at New York of a 'prime bullock' is 1400 lbs., and that of a 'common bullock,' is 1100 lbs. Average freights per head, 3*l.* 10*s.* They have been as low as 2*l.* 10*s.* and as high as 4*l.* 15*s.*

"Philadelphia.—Prime shipping are held at 5¾ cents (3¾*d.*) per lb. They weigh from 1250 to 1500 lbs. A beast of 1500 lbs. is landed at Liverpool for 24*l.* 10*s.* Average freight is the same as New York, 3*l.* 10*s.*

"Baltimore.—Freight per head to England averages the same as New York

and Philadelphia, 3*l.* 10s., although it has been as high as 4*l.* Cattle landed in England will cost there from 90 dols. to 110 dols. per head, clear of any charges (18*l.* 15s. to 23*l.*). The freight on kine from Baltimore to England averaged 4*l.* 5s. per head; it was as low as 3*l.* and as high as 5*l.* 15s. during this past season.

"BOSTON.—Cattle here are reckoned at so much per lb. living weight. The average weight of each animal sent over is 1450 lbs. 5½ cents (3¼*d.*) per lb. is the average price on board. Freight averages the same as the other ports, 3*l.* 10s., although it has been as high as 4*l.* Cattle cost, landed in England, on an average, 22*l.*

"As to the future prospects of the cattle trade between Great Britain and the United States, I think the following points should be known.

"If the present restrictions in England on cattle from the United States were removed and they were allowed to be landed alive, the trade would increase enormously, and give employment for a large number of British steamers now lying idle; in fact, more would be built expressly for this trade. Notwithstanding the present restrictions and the prejudice created by reports of pleuro-pneumonia and other diseases among American cattle, the shipments from the United States have shown a substantial increase this year. One firm alone in New York sent 2800 head of cattle the last week of July to Great Britain. Dead American meat is sold in London at 6½*d.* per lb. at a profit, and it is said that even if sold at 5½*d.* it would give a small profit.

"As long as shippers from New York obtain in Liverpool not less than 7*d.* or 7½*d.* for their 'prime' beef, so long will a remunerative trade be open to them; but they have obtained readily prices ranging between those given above and 9*d.* per lb., according to the state of the market. While these prices are obtained, the shipments of American cattle will continue in increasing quantities, for with the vast stock-raising lands in the West there is practically no limit to the exportation; and with reference to this I will mention that in 1877 there were 30,500,000 head in the United States, and next year the returns will probably show 35,000,000. Last year 86,000 head were landed in the principal ports of the United Kingdom, 67,000 more than in the previous year, mostly from the United States, 30,925 from the port of New York alone, to various countries in Europe. It is calculated that England took 24,834, at 97 dols. a head (say 20*l.* 4s.), and Cuba 40,000 head, at 17 dols. each (say 3*l.* 11s.); the wild grass-fed Texans to Cuba, and the Shorthorn grades with better feeding to England and Europe; the latter selling for less than five times the price of the former. The weight of the Shorthorn grades was about twice that of the Texan. Ten years will, it is stated, bring a remarkable change in the quality and weight of these Texans, and the improvement will possibly be more than enough to supply in quantity the present exports to Europe. Each year probably adds nearly 100 lbs. per head to their live weight. Exportation stimulates careful breeding, enhancing the character, quality, and weight of the animal. This improvement in breeding will be equal to an increase of 25 per cent. in number of cattle. Better feeding produces earlier maturity, and therefore, if 5,000,000 of these are ready for market at two and a half years instead of three years, and 5,000,000 at three years and a half instead of four years, this would give about 16 per cent. more cattle for market each year without increase of the whole number kept.

"Oxen are raised in the State of Colorado, and ready for market at a cost of 4 dols. (or 16s. 8*d.*) per head, and it is claimed that on a large scale it can be done for 3 dols. (or 12s. 6*d.*) per head. That the United States is destined to supply England with its main supplies of food I have no doubt, for as one of my informants states, first, it is in the very nature of American enterprise to push a trade which affords a profit, and to resort to all manner of 'cheapening' processes and methods to make it more profitable; secondly, the extension of

railroads and their facilities into Nebraska, South Missouri, and Texas, all stimulate breeding and increase and cheapen both cattle and their transport to the coast; thirdly, British shipowners will construct vessels with a special view to the rapid and improved conveyance of animals across the ocean, and despite the check caused by the pleuro-pneumonia scare the traffic will increase. Another gentleman writes from New York:—'The cattle dealers here are prepared to work at an even much smaller profit than the present, which they admit is paying handsomely. Even if freight goes up, which is a straw upon which our farmers in England are clinging, I do not believe that it will help them materially; I imagine that if any brighter look-out arises, it will be from the intense railway speculations going on in the United States, and from the immense sum which must be forthcoming for the renewal of the 80,000 miles of rails already commencing. Will not foreign shareholders require the interest on their money invested, when they find large payments will have to be made for renewal of plant? Will not further capital be required on this account? I only mention this, as it is just possible a rise in transport charges may some day occur if railway directors find the pressure greater than they can bear.'

"The United States Treasury Department has recently revoked its order of February last, in which the importation of neat cattle from foreign ports was prohibited; they are now subjected to a quarantine of not less than ninety days under direction of Custom-house officers, and at the expense of parties interested in the shipment.

"THE PIG TRADE.

"Now let us see how we stand as to our imports of pigs.

"From the ports of New York but few pigs have been shipped this year. The price of pork at New York has varied since 1st January from 4 cents to 6½ or 7 cents per lb.; but 5 cents would be a fair average (2½*d.*). The rate of freight is equal to about 1½ cents per lb., making the average price in Liverpool 6½ cents per lb. (3¼*d.*). The average weight of pigs sent from this port for the European markets is 170 lbs. Larger animals are not shipped, being unsuitable for those markets. A pig of 170 lbs. landed in Liverpool would cost 2*l.* 10*s.*

"From Philadelphia.—Pigs shipped weigh under 200 lb. Their prices range from 4 cents to 4¼ cents per lb. (2¼*d.*). The freight to Liverpool is 10*s.* a head, and the pig is landed there for 5¼ cents per lb. (or 2½*d.*). A pig of 186 lbs. would be then landed for the sum of 10 dols. 50 cents (or 2*l.* 4*s.* 9*d.*).

"From Baltimore.—Pigs landed in England cost, freight included, about 8 cents (or 4*d.*) per lb. A 170 lb. pig from Baltimore would thus cost 2*l.* 17*s.* 8*d.*

"From Boston.—Pigs shipped cost 5½ cents (or 2¾*d.*) per lb., and freight 10*s.* a pig. The weight of pigs sent from Boston are given at 200 lbs. A 170 lbs. pig would cost, landed in Liverpool, 2*l.* 9*s.* 9*d.*

"Pig exports from the United States during the fiscal year 1878 exceeded all other exports of domestic animal products by more than 36,000,000 of dollars. Thus:

Pig Exports, 1878.

	Dols.
Bacon and hams	51,750,205
Lard	30,014,023
Pork	4,913,646
Lard oil	994,440
Live hogs	267,259
Total ..	87,939,573

ALL OTHER ANIMAL EXPORTS, 1878.

	Dols.
Cattle and cattle products	49,230,366
Horses	798,723
Mules	501,513
Sheep and their products	874,093
All other and fowls	46,841
Total ..	51,451,536

"During the ten months of this present year to April 30th last the value of pig exports appears to have fallen off, owing to the small price they have brought. The quantity, on the other hand, was more than 100,000,000 lbs. larger. There was an increase in the demand, but the supply has been so large as to depress the market value.

"This year the results from experiments made for the extraction of sugar from the Sorghum plant and Indian corn, and from the beet, will be known, and if any one of these is a success in sugar production and good profits, we may see a diminution in the growth of wheat in favour of the more profitable plants. Canada is also making experiments with the Sorghum cane. The statements given above I have every reason to feel are correct; if any errors are to be found, they will be so small that they may be forgiven.'

"VICTOR DRUMMOND.

"H.B.M. Secretary of Legation at Washington.

"Kissingen, *Sept.* 10."

In a further communication to the Editor of the 'Daily News,' Mr. Drummond gives additional information as to recent reductions in the freights from Boston to the United Kingdom, and as to the wages of labourers in the United States:—

"SIR—In my letter to you from Kissingen, which, together with its enclosures, you were good enough to take notice of, I mentioned that cattle from Boston cost, landed in Liverpool, 22*l.*; pigs, 2*l.* 9*s.* 6*d.*; wheat, 1 dol. 21 cents per bushel. Since the beginning of the month, however, as my correspondent from Boston informs me, freight-rates have been lowered as follows, and are likely to remain so for the next four or six months. Cattle freight is now 2*l.* 10*s.* instead of 3*l.* 10*s.* to 4*l.*; pigs ditto, 7*s.* instead of 10*s.*; wheat ditto, 5½ cents per bushel against 7½ cents per bushel. I see mention made in the papers lately respecting the rate of farm labourers' wages in the United States and Canada. I am enabled to give an authentic statement of the wages to this class of workmen for each state and territory in the United States, and for certain places in Canada. I should be much obliged if you can find space for them in the columns of the 'Daily News.'

"I am, Sir, your obedient servant,

"VICTOR DRUMMOND.

"Engelberg, Switzerland, *September* 26."

UNITED STATES.

Average Farm Wages for 1879.

	Per Month, by the Year.		Per Day.			
			Transient in Harvest.		Ditto not in Harvest.	
	Without Board.	With Board.	Without Board.	With Board.	Without Board.	With Board.
	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.
Maine	18·25	11·08	1·42	1·09	0·97	0·72
New Hampshire	19·75	12·30	1·25	96	98	74
Vermont	15·00	10·22	1·29	97	91	64
Massachusetts	25·00	15·33	1·50	1·00	1·05	75
Rhode Island	20·00	10·00	1·00	75	1·00	50
Connecticut	23·29	14·23	1·86	1·25	1·50	88
New York	20·61	13·19	1·53	1·18	92	68
New Jersey	20·22	11·53	1·55	1·30	99	68
Pennsylvania	19·92	11·46	1·33	99	96	68
Delaware	18·00	9·50	1·37	1·00	75	48
Maryland	13·50	8·95	1·43	1·12	75	44
Virginia	10·68	7·66	1·16	96	63	41
North Carolina	11·19	7·66	99	76	58	41
South Carolina	9·83	6·66	89	68	53	44
Georgia	10·73	7·38	98	61	58	53
Florida	13·80	8·73	1·02	73	76	50
Alabama	12·20	8·30	96	77	69	55
Mississippi	13·31	9·28	1·00	85	78	62
Louisiana	16·40	11·27	1·03	77	85	66
Texas	18·27	11·49	1·30	94	92	60
Arkansas	17·12	11·31	1·38	1·08	86	50
Tennessee	12·73	8·96	1·28	98	69	55
West Virginia	16·98	10·94	1·26	95	80	53
Kentucky	15·17	10·00	1·49	1·15	77	83
Ohio	20·72	13·34	1·51	1·17	1·00	82
Michigan	22·88	14·64	2·02	1·55	1·16	69
Indiana	19·20	12·76	1·68	1·28	90	73
Illinois	20·61	12·01	1·52	1·18	1·01	79
Wisconsin	21·07	13·81	2·11	1·70	1·12	94
Minnesota	24·55	15·62	2·63	2·25	1·27	80
Iowa	22·09	13·90	1·66	1·57	1·12	79
Missouri	17·59	11·84	1·47	1·17	67	59
Kansas	20·67	13·28	1·70	1·32	1·05	72
Nebraska	23·04	14·86	2·17	1·66	1·29	90
California	41·00	26·27	2·27	1·76	1·65	1·23
Oregon	35·45	23·86	2·02	1·54	1·44	1·08
Nevada	..	35·00	2·08	2·00	..	1·25
Colorado	35·00	20·00	1·82	1·55	1·83	1·19
Utah	28·87	20·50	1·43	1·00	1·46	1·12
New Mexico	22·10	13·80	2·15	67	81	56
Washington	35·83	24·34	2·59	1·61	1·55	1·11
Dakota	28·56	16·57	..	2·26	1·34	92

CANADA, 1879.—FARM LABOURERS' WAGES.

Montreal.—The wages average from 10 to 14 dollars per month for the summer months, and from 100 to 120 dollars per year, with board.

Goderich, Kincardine, Meaford.—Sault Ste. Marie: 132 dollars per annum, with board. Owen Sound: 10 to 12 dollars per month, with board. Collingwood: 12 to 18 dollars per month, with board. These places are all in the State of Ontario, the great agricultural State. The average daily wages are 1 to 1¼ dollar, farm labour being now 25 per cent. lower than it was five years ago. The above information I have obtained from the reports by United States Consuls on rates of wages, &c., published by the State Department last month.

The dollar is equivalent to 4*s*. 2*d*.

XXI.—*Report of the Senior Steward of Live-Stock on the International Agricultural Exhibition at Kilburn*, 1879. By W. Wells, Esq., Senior Steward.

The International Exhibition of the Royal Agricultural Society in the neighbourhood of London—at Kilburn—is over. Marred, as its complete success undoubtedly was by the continuance of the relentless and exceptional weather, which, since last October, has made the sun an almost entire stranger to our island, and has already blighted our hopes of a good ingathering of our hay, as it is now imperilling our corn crops; yet, in compensating contrast to the serious effects of the weather upon the comfort of the spectators, the business of the exhibition, and the financial results to the Society, there were many noteworthy features which helped to mitigate the force of these untoward circumstances, and to leave many agreeable recollections of the Great Show of 1879.

It is not in mortals to command success, but it is in them to work hard for it, and assuredly no similar undertaking ever had a greater measure of unceasing labour and attention bestowed upon it. From the moment it was decided to hold the Exhibition in the metropolis, or as near to it as possible, every exertion was made to render it worthy of the occasion, worthy of the Society, and worthy of their Royal President—the Prince of Wales having graciously consented to accept again the office which he held ten years before at Manchester.

With the sanction of the late, and under the auspices of the present Lord Mayor, a meeting was held last summer at the Mansion House, and an influential Committee formed to assist the Society financially and otherwise. The subscriptions collected by the Committee amounted to over 8500*l*., a sum below what had been anticipated, probably from an insufficient allowance having been made for the general depression in business.

Following so closely upon the International Exhibition in Paris last year, it was resolved to invite foreign competition at Kilburn, and prizes for foreign horses to the amount of 700*l*., for

cattle to over 2000*l.*, with a proportion also for sheep were accordingly offered. The entries for horses were fairly numerous, 59 in all. The characteristics of the various breeds were interesting, and will, with those of the cattle and sheep, be noticed in detail in the stock reports. Cattle were not sent in any number; there were only 57 entries. The delay, and probably the anticipated expense of the quarantine regulations, though in fact the expense was borne by the Society, were obstructions of too serious a nature. A good display of some of the more prominent foreign breeds would have been specially interesting at this moment when attention is being so much drawn to milk *v.* beef; and even as meat producers the Charolais would have shown well by the side of our beefiest races. In sheep, the Merinos of France and Spain were represented.

The international character of the Exhibition was further maintained by prizes being offered for foreign hops, corn, wool, butter, cheese, hams, bacon, and preserved meat; prizes also being respectively given for American or European fresh meat found to be in the best condition after having travelled at least 1000 miles, or which had been slaughtered not less than fourteen days.

The award of the prize of 50*l.*, with the gold medal of the Society, offered for "the best waggon for conveying perishable goods, meat, poultry, fish, &c., &c., by rail, at a low temperature, a journey of 500 miles," to the "Swansea Waggon Co.," became the subject of legal contention by the only other competitor, Colonel Mann, whose motion, however, before the Master of the Rolls, was refused with costs. The temperature of the waggon to which the prize was awarded, had preserved an average of about 39 degrees, or nearly 10 degrees less than that of the competing waggon, which was itself commended for its principles of construction and finish.

These large foreign and other unwonted additions to the ordinary contents of the Showyard—themselves greatly in excess of those at any previous exhibition—necessitated a considerable increase in the size of the ground to be selected, and the 103 acres hired from the Ecclesiastical Commissioners were no more than sufficient for the purpose. Some idea of the enormous scale of the Showyard and its contents may be gathered from the following statement (p. 555) of the shedding required for the implement yard alone, and of the entries in the stock yard.

For details of the Showyard, extremely interesting in themselves, but too long to incorporate in a general sketch, the reader is referred to the valuable 'Illustrated Guide to the Royal Agricultural Society's Metropolitan International Exhibition,' edited by Mr. Kains-Jackson, with a preface by Sir

SHEDDING IN IMPLEMENT-YARD (in FEET).

	London. 1879.	Bristol. 1878.	Liverpool. 1877.	Birmingham. 1876.	Taunton. 1875.	Bedford. 1874.	Hull. 1873.
Ordinary	16,000	11,735	12,183	11,304	8118	11,402	9150
Machinery in motion	4,683	2,847	2,733	2,492	1557	2,585	1788
Seeds and Models	2,220	964	880	886	452	766	793
STOCK-YARD.							
Horses	815	350	369	424	234	412	281
Cattle	1,007	443	378	465	340	403	308
Sheep	841	397	418	407	359	486	365
Pigs	211	164	140	203	164	226	191
Total ..	2,874	1,334	1,305	1,499	1097	1,527	1145

Brandreth Gibbs, and with articles by Mr. James Howard, Mr. M'Combie, Mr. Ransome, and others. It is here shown that the total amount of shedding in the ground extended to over 12 miles; the total distance to be walked by a visitor was from 16 to 18 miles. The amount of prizes offered for horses was 3590*l.*; for cattle, 5635*l.*; for sheep and goats, 2065*l.*; for pigs, 300*l.*; for wool, dairy produce, bees, provision waggon, &c. &c., 1610*l.* more, making a total of 13,200*l.*

These figures may be welcome to those visitors who, however desirous of seeing the Show, were so weather- and mud-bound that they never left the vantage ground of the sleeper-made main roads, and could only guess at what lay in the undiscovered regions right and left of them. Certainly, under the circumstances, it would have been handier to have had a Showyard more of the dimensions of the first exhibition of the Society in 1839, where the whole of the cattle prizes were not much more than half of this year's prizes for Shorthorns only, or 385*l.* against 750*l.*, while those for horses were 10*l.* less in amount than was this year given for asses, or 50*l.* as against 60*l.*

It will be readily believed that the disappointment to the Council that this grand display of all most worth seeing in connexion with agriculture—all the most perfect types of the animals of the farm—all the latest and most ingenious kinds of machinery and implements—should have been to a great extent thrown away, was a severe one. Undoubtedly there was always felt to be

some risk of the state of the ground in bad weather; but, in the first place, there was an amount of persistency in the bad weather which could never have been reasonably anticipated; and in the second place, no better ground within anything like easy reach was to be had. The week before the Kilburn Show, the Alexandra Park—considering that there was no heavy implement traffic during the horse show there—was in a deplorable state. The week after, even the light soil of Wimbledon Common was, during the encampment—without any implement-, and with but little carriage- or horse-traffic—reduced to a sea of mud about the camp, and locomotion was carried on, in no small degree, 'à la Kilburn,' on planks.

What the condition was to which the continued wet reduced the ground at Kilburn may be partly gathered from the nature and extent of some of the remedies invented and adopted. No expense or care in preparing the site had, in the first instance, been spared, the original cost of draining having, according to Mr. Hunt's report, been about 1200*l.*; to which must be added 2200*l.* for levelling, turf-laying, ballast-burning, and road-making. This, it was hoped, would prove sufficient, and it was not until a few weeks before the Show that the continuous and increasingly heavy fall of rain, concurrently with the development of the preparation-traffic, gave rise to any feelings of apprehension.

As the day for opening the Exhibition was near, and the heavy implements and machinery began to come in, without the hoped-for change in the weather, it became painfully apparent that the struggle to get things in their places would be desperate and protracted. By the end of the week preceding the opening, the approaches to and spaces between the implement shedding, as well as much of the rest of the ground, was worked by incessant traffic into a wide sea of tenacious mud, through which it was impossible without a quadrupled horse-power to move the heavy exhibits into their places.

The efforts made by the railway companies concerned to fulfil their undertaking to deliver the exhibits were unceasing. Horses in numbers were lent by other railways. Gangs of men, relieving each other, worked through the night as well as day, and never was a vote of thanks better earned than that which was given at the General Meeting to the railway companies, with a special mention of Lord Richard Grosvenor, whose energy in organising, in conjunction with the untiring officials of the London and North-Western Railway, the means of relief to blocked-up trains or mud-bound vehicles, was fully recognised and appreciated.

The following is the substance of a communication in refer-

ence to the work thrown upon the London and North-Western Railway. It gives an account of the never-to-be-forgotten Kilburn Railway difficulties:—

They—the L. and N. W. Co.—had 2983 waggons of implements for the Show, which they mainly received between the 18th and 29th of June. They had also 407 trucks containing horses and cattle, which they received on the 27th and 28th of June. The weight of the implements was about 4000 tons; but this weight was of course exclusive of the implements and other goods that were carted in direct from other railway stations, and of a quantity delivered by road.

The exceptional circumstances of their work were that they had to employ a force of from 300 to 500 men and 240 horses, at a considerable distance from their usual places of work, during the night and day, over a period of 11 days, during which the rain was almost incessant, and the ground upon which the heavy goods had to be drawn consisted of 100 acres of mud from 6 inches to 4 feet deep. Seven or eight horses could do with difficulty what one ought to have performed with ease, and the vehicles in some instances could not be extricated without the aid of screw-jacks or other mechanical appliances.

The Society found it necessary to put down a corduroy road made of old sleepers, and nearly 10,000 sleepers were supplied to them by the railway company for this purpose.

The difficulties of getting on to the ground were so great as to necessitate their working the last week with relays of men from 2 A.M. to 9 P.M. each day.

The largest staff they had on the ground on one day was about 240 horses, and 500 men, and upwards of 2000 meals were served out to the men on one day.

Had the ground been in ordinary fair condition, the work would have been done with the greatest ease, but the incessant rains increased the expenses and difficulties at least fourfold, and the company incurred a serious loss by the transaction.

If the railway difficulties were great, those of the Society were not less. Hundreds of loads of ballast were procured to form the main road, much of it being laid over flake-hurdles, of which a large number of truck-loads were procured; while the amount of planking used—in addition to the 14,000 sleepers supplied by the several railway companies—was enormous. The actual expenditure in these extra works was as follows:—

	£
14,078 sleepers bought from railways, including carriage by rail and casting, less sleepers resold	860
24,000 flake-hurdles bought, including carriage and cartage, less hurdles resold	800
2786 yards ballast bought, including carting	557
3428 deals, less those resold	455
Draining pipes	45
Labour account	460
Team labour	152
	£3329

Perhaps it may be here permitted the writer, whose own work

was but little affected, to say, that these material and other difficulties, such as altered arrangements, unceasing applications from distracted exhibitors, and all the heavy extra labour entailed by the unlooked-for circumstances of the occasion, were met on the part of the officials of the Society with an amount of energy, patience, and resource which was worthy of all praise, and which was cordially recognized in the press and by the public.

However successful were the efforts to make a good main road, it was found impossible, with all the planks which London could supply, or which, at any rate, could be got into the yard, to give even a tolerable access to the stands of the implement makers; and as one wet day succeeded another, the question arose of extending the time of the Exhibition. This was agreed to by the Council after a meeting held by the exhibitors, at which a proposal to extend the time for keeping open the implement department was carried, the closing of that department being accordingly deferred to Thursday the 11th; the stock department closing on Monday the 7th, as originally fixed. This extension of time was determined on in the interests of the implement makers, in the hope that some bright days to finish with would help to recoup them for losses and disappointments. Unluckily the pitiless rain continued, and it is to be feared that the additional time was scarcely more profitable to them than to the Society.

What the financial result of the attendance, sale of catalogues, and admittance to the horse ring was, is given in the subjoined summary (p. 559).

Up to the present year, since the establishment of the Society, the total amount at their Exhibitions of "Expenditure in excess of Receipts" has been 59,035*l.*, and "Receipts in excess of Expenditure, 27,414*l.*; leaving a balance of 31,631*l.* on the wrong side, which will be increased by at least 10,000*l.*, as the result of the Kilburn Exhibition.

The Sunday services were well attended, the sermon in the morning on the 29th of June having been preached by the Dean of Westminster, and that on the 6th of July by the Rev. W. Lutman, Chaplain to the Lord Mayor. In the respective afternoons the preachers were the Rev. Dr. Williams, Rector of Brondesbury (the parish in which the Showyard was situated), and the Rev. Canon Duckworth.

One very special feature of the Exhibition must not be forgotten. The novelty of the International Dairy—where were exhibited daily in full operation various systems of English and foreign butter- and cheese-making, together with a large variety of implements and dairy appliances—was much appreciated by the public, who formed each day and all day a gallery of interested spectators four or five deep.

STATEMENT of RECEIPTS for ADMISSION, GRAND STAND and CATALOGUES.

Date.	Charge.	Numbers Admitted.	Entrance-Money Received.	Catalogues.
	s. d.		*£ s. d.*	*£ s. d.*
Monday .. 30th June..	5 0	4,319	1,005 8 10	256 10 0
Tuesday .. 1st July ..	5 0	3,317	828 16 0	75 0 0
Wednesday 2nd ,, ..	2 6	21,147	2,643 19 11	325 0 0
Thursday .. 3rd ,, ..	2 6	9,431	1,178 5 5	95 0 0
Friday .. 4th ,, ..	1 0	35,162	1,759 5 1	142 0 0
Saturday .. 5th ,, ..	1 0	50,255	2,478 1 8	104 10 0
Monday .. 7th ,, ..	1 0	43,554	2,165 5 6	144 15 0
Tuesday .. 8th ,, ..	1 0	10,190	508 4 1	20 0 0
Wednesday 9th ,, ..	1 0	5,702	284 16 0	12 0 0
Thursday .. 10th ,, ..	1 0	4,246	212 6 6	15 5 0
Total	..	187,323	13,064 9 0	1,190 0 0
Season Tickets	..	..	1,318 7 0	
				14,382 16 0
GRAND STAND:—				
Monday	2 0	..	95 8 0	
Tuesday	2 0	..	32 7 0	
Wednesday	2 0	..	267 12 0	
Saturday	1 0	..	144 1 0	
Monday	1 0	..	101 8 0	
				640 16 0
Grand Total ..	..	..	.. ..	16,213 12 0

The following notes on the proceedings in the International Dairy have been kindly furnished me by Mr. Allender, one of the directors of the Aylesbury Dairy Company, who took a leading part in the arrangement and conduct of the dairy department.

Royal International Agricultural Exhibition, 1879.

The Dairy Shed at Kilburn was divided about equally between the English and foreign sections. The English division, with some American appliances, was worked by the Aylesbury Dairy Company, the foreign was in the hands of M. Ahlborn, of Hildesheim, with the exception of a single churn from Normandy, sent over by request of the Society.

The milk and cream used in the foreign section were supplied by the Society, that in the English Section was found by the Aylesbury Dairy Company.

Unfortunately no cheese by any French method was made. The churn, though an admirable one, did not work well, the pulleys not being of the proper size, and butter was made only on three days of the Show.

In the German section about 70 gallons of milk per day were used, and the milk was set on the "Swartz" system, and the cream made daily into butter on the German (or rather M. Ahlborn's system), the chief feature of which is that the butter is not washed at all with water. It is removed from the churn by the aid of a wooden scoop, placed in a wooden tray or trough to

allow the bulk of the buttermilk to drain from it, and is then worked on the butter worker for the purpose of abstracting the remainder of the buttermilk. M. Ahlborn explains the theory to be that the butter suffers in quality through being washed in water; but this is entirely contrary to the Norman system, and I believe it is not the system followed in Denmark, where such fine butters are made.

Cheese was made on three or four occasions in the German Dairy, but only from skimmed milk and on the ordinary Dutch system, excepting a few pounds of Limbourg cheese made on one occasion.

In the foreign section there was a Separator to which was awarded the Society's medal. I conclude that full particulars of this will be given in the report on the implements.

In the English section, worked by the Aylesbury Dairy Company, the Society's programme was carried out daily. About 400 gallons of milk were made each day into cheese; Cheshire and Cheddar by dairymaids from Cheshire and Wiltshire respectively, and Double Gloucester and North Wilts by the Aylesbury Dairy Company's cheesemaker. On the last three or four days of the Show a rough-coated cheese, which is made in some parts of Cheshire and strongly resembles Stilton, was made.

Churning was carried on during the whole of each day, 150 to 200 lbs. of butter having been made. The churns used were Thomas and Taylor's "Eccentric" which took the first prize at Bristol last year; one of Bradford and Co.'s "Midfeathers," an improvement on the one which was commended at Bristol, the dashers being fixed similarly to those in the Normandy churn, i.e., free from the circumference; and a small American "Oscillating" churn, which did not arrive from America until the Wednesday following the opening of the Exhibition.

The Aylesbury Dairy Company adopt the deep-setting system where practicable, and exhibited the pans for this system, as well as all other dairy utensils.

They also exhibited a "Cooley Creamer," which is in some respects an improvement on the "Swartz" system, as the milk is set *under* water, and is thus protected from atmospheric impurities, but there are so many taps, valves, and other arrangements connected with it that for actual work on anything like a large farm the "Swartz" system would probably be found superior. For small model dairies one or two of the "Creamers" would doubtless be found to answer well.

The "Separator" referred to by Mr. Allender was a small machine, which, having an interior part of it driven at a high velocity, at once delivers the milk poured into it, as cream through one exit pipe, and as skim milk through another. It will of course be described in the implement report, and in the meantime has been explained and figured in the 'Agricultural Gazette' of the 25th July.

The general characteristics of the exhibition having been thus sketched, it only remains to put on record and give due prominence to the kindly interest shown by the Queen, the Prince of Wales, and others of the Royal Family, in the success of the undertaking.

The visit of the Queen, deferred on account of the pelting rain from Tuesday July 1st, took place on Saturday the 5th, on which day, although the weather was still unpropitious, Her

Majesty arrived by 10.30 A.M. from Windsor, and, being driven into the centre of the large horse ring, saw paraded before her the whole of the prize winners in the cattle and horse classes, including the foreign horses, and the interesting classes of mules and asses. Happily only a slight shower fell during the royal visit, and nothing could be more successful than this parade of some of the finest animals which science and experience in the art of breeding have hitherto produced. It had been hoped up to the last moment that Her Majesty could have had her attention drawn to other departments in the Exhibition—to the magnificent show of implements and machinery, as well as to the International Dairy, but the relentless rain, and its now historic effect on the Kilburn clay, rendered it impossible for the Queen's carriage to leave the main road, which, by almost superhuman efforts, continued by night and by day, had been made good the whole length of the Show-yard.

Leaving the large central ring, the Queen, on her way back to the station, passed by the Members' Pavilion, in front of which were drawn up some 200 or more of the Irish farmers, who, in a party organized by Canon Bagot, had come over to see London and the Exhibition. By these Her Majesty was received with vigorous and loyal cheers; and it may be mentioned that after the Queen's departure the whole of the Canon's party proceeded by invitation to Marlborough House, where they had an interview with the Prince of Wales, and were presented to the Princess of Wales and the Duke and Duchess of Connaught.

The interest so kindly shown by the Queen in the proceedings of the Royal Agricultural Society, by her presence at Kilburn in the morning, was still further proved by Her Majesty, after her return to Windsor the same day, driving to the Norfolk Farm, where, under the guidance of a Committee of the Society appointed for the purpose, some five-and-thirty foreign gentlemen distinguished or interested in agriculture were assembled to inspect the royal farms, and enjoy a luncheon provided for the party by Her Majesty's command. A permission to visit the private apartments at the Castle, and a presentation of a few of the foreign gentlemen to the Queen, on her meeting the party in her drive near the farm, were further instances of Her Majesty's gracious desire to assist the Society in their endeavours to give a cordial reception to their "international" visitors, who, it must be noted, had on the two previous days paid visits, on Thursday, by the invitation of the Duke of Bedford, to Woburn Abbey and the experimental field there, on Friday, by the invitation of Mr. Lawes, to Rothamsted. Complete success attended both expeditions, and the visitors were earnest in the

expression of their great interest in all they saw, and of their deep sense of the kind reception which had been given them on these occasions.

Then, again, it will be remembered by every member of the Royal Agricultural Society how, from the moment he consented to accept for the year the Presidency of the Society, the Prince of Wales devoted himself in a thoroughly practical manner to promote the success of the great enterprise undertaken by the Council. His Royal Highness's constant attendance at the Council meetings in Hanover Square was only a prelude to his visits, both public and private, to the Showyard, made in the course of four different days, on two of which he was accompanied by the Princess of Wales—an example of interest in the exhibition which was followed by the visits of various members of the Royal Family, as well as of other royal and notable personages, including among the last the Earl of Beaconsfield.

Nor will any one who was present at the magnificent entertainment at the Mansion House, given by the Lord Mayor, Sir Charles Whetham, forget how admirably the Prince of Wales, in his capacity of its President, responded to the toast of "Prosperity to the Royal Agricultural Society."

The close of his year's presidency was marked by an excellent speech from the Prince at the general meeting, and by the following thoughtful and gracious letter addressed to the Council of the Society :—

"My Lords and Gentlemen.—I am unable to let my presidency of the Royal Agricultural Society end without expressing to the Council my best thanks for the hearty co-operation which I have received during the past year in carrying on the business of the Society.

"It has been a sincere pleasure and gratification to me that the annual Show of the Society, held at Kilburn, which fitly grew into an international exhibition, has been crowned with success. It has brought together the largest number and finest show of animals ever exhibited, as well as the most numerous and interesting collection of implements and machinery.

"The weather alone has marred a still greater success by preventing a much larger number of people from visiting the exhibition, as might otherwise have been the case. From this cause the funds of the Society will, I fear, be materially crippled; but I trust that the numerous features of great interest which were brought so prominently before the public by the Royal Agricultural Society at the exhibition may induce many to give that support to the Society which it so well deserves, by becoming either annual or life members.

"I should wish to express my sincere thanks—in which I am sure the other members of the Council and of the Society join—to Mr. Jacob Wilson, the general manager, Mr. Jenkins, the secretary, and to the stewards, with their subordinates, for their great efforts, in circumstances of no ordinary difficulty, not only by enabling the show to be opened in time, but by keeping all matters connected with their several departments in order during the exhibition. This could only have been done by an amount of zeal and hard work which deserves all praise, and I therefore take the opportunity at this, the

last meeting of the Council, to express what I feel is justly due to those who have rendered us such valuable service.

"I have the honour to be, my lords and gentlemen, your obedient servant

"ALBERT EDWARD, P., President.

"To the Council of the Royal Agricultural Society."

There are things which under any disappointment leave pleasant memories behind, and if, as has been said, some feelings of mortification must arise at the thoughts of a complete success having been marred by the weather, yet, when to the attractions of a surpassingly fine show of stock and implements there are added the visit of the Queen, the presidency of the Prince of Wales, the many excellent foreign exhibits, the International Dairy daily at work, the interesting comparative museum of old and modern implements, the plans of farm buildings, and many minor novelties, the bright side of the picture only remains, and distance lends a far from fictitious enchantment to the view.

My four years of office—in one of which I much regret I was unable to perform my duties as Steward—having ended, I gladly take the opportunity of thanking my brother Stewards and all our officials for much kindness and ever ready help when required. May the sun shine brightly on them at Carlisle!

Holme Wood, Peterborough.

XXII.—*Report upon the Exhibition of Horses at Kilburn.* By the Hon. FRANCIS LAWLEY.

IT was sagaciously remarked by Sydney Smith, that Providence, by endowing this country with an uncertain, erratic, and inscrutable climate, had mercifully supplied—to quote a phrase from Hamlet—its "muddy-mettled" inhabitants with a never-failing topic of suggestive conversation. "How," asks the witty Canon of St. Paul's, "could a race so dull of wit and unready of speech as the British find material wherewith to salute each other in the streets, and get through the ordinary business of life, were it not for meteorological platitudes?" The talk about the weather has, during the present year, fulfilled far more than the normal functions which, according to this theory, it was intended to subserve, inasmuch as it stands upon record that, until the first few days of September, there was not a single week of 1879 during which more or less rain had not fallen. The absence of sun and heat, aggravated by continual downpours of rain and by cold winds, has already inflicted upon these islands a loss approximately estimated at sixty millions sterling. But

the Royal Agricultural Society of England has, in addition, substantial reasons for remembering the exceptional "severity" —the word in this connection is Lord Byron's—of a summer during which its Council and Members resolved to inaugurate a Show, the greatest, most diversified, and all-embracing that had ever been attempted in this or any other country, with a view to arresting the attention of farmers. The capital of the British Empire, justly regarded as the heart of this terrestrial globe, was selected as the site upon which this unprecedented enterprise should take shape and form ; but such was the difficulty of finding an area of one hundred acres uncrossed by a footpath in the outskirts of London, that, despite its clay soil, Kilburn was pitched upon as the only available spot. There is little wit and less wisdom in exclaiming, as so many journalists with *ex post facto* sagacity have taken delight in doing, that the peculiar tenacity of the London clay, upon which Kilburn stands, rendered the site singularly inappropriate for the intended purpose. The truth is, that not only would Kilburn not have been selected had it been foreseen what manner of a June and of a July were in store for us, but that the "International Agricultural Exhibition" would, in contemplation of so remarkable a summer, have been bodily and altogether postponed until a more convenient season. The manufacturers of ponderous machinery and of agricultural implements, infinitely varied in shape and structure, but weighing in some instances tons upon tons of avoirdupois, are doubtless under the impression that the unparalleled rains which fell in June militated more disadvantageously against their interests and pockets than against those of the owners of stock—equine, bovine, porcine, and ovine—who had but to drive their animals on the hoof through the glutinous mud instead of dragging steam-threshers and tramway waggons across the Slough of Despond. But the truth is, that, once lodged under the protecting canvas, machinery, being inanimate and nerveless, was insusceptible of temporary deterioration ; whereas, on the other hand, the horses—than which, man alone excepted, there is no more highly strung and sensitively organized animal—betrayed at once the effects upon their coats, upon the lustre of their speaking and often interrogating eyes, and upon their general well-being, produced by incarceration in an unfamiliar wooden hut, under the depressing circumstances depicted in that misery-breathing line from the Poet Laureate's pen, of which the scene is laid "in the dead unhappy night, and when the rain is on the roof."

It would be easy to mention many instances in which the horses exhibited at Kilburn showed their susceptibility to the "skyey influences" which redounded to their disadvantage. For

the moment it will suffice to notice two animals, each of them being members of what may be called the equine aristocracy, which were seen at their worst, although in many other classes, even of the coarsest type, the same phenomenon was observable. In the class of "thoroughbred stallions suitable for getting hunters," the first prize was awarded to Mr. Clare Vyner's beautifully formed, but somewhat delicate, chestnut horse, "Duc de Beaufort," bred in sunny France. That so light a sire should have been deemed likely to get good hunters was probably due to the fact that, as is often the case with little horses, his stock are credited with being larger and more robust than himself. But two or three days at Kilburn produced in the "Duc de Beaufort" a manifest alteration for the worse; while, simultaneously, the heavy mud through which he was called upon to show his paces developed in him symptoms of what seemed to some to be incipient stringhalt. Again, in the class for weight-carrying hunters—a very creditable class, too, both for number and quality—M. Cecil Legard's "Blacklock," by "Toreador," dam by "Robinson," was not only a very inferior animal as compared with his appearance at Alexandra Park, but also it was patent to those who watched him closely and heard him cough that, despite his magnificent action in galloping, the horse was pining and ill at ease.

It has often been debated whether the subjection of horses to a kind of competitive examination in the show-yard advances the genuine interests of agriculture and affords compensation for the outlay incurred by the award and distribution of prizes. Many notable breeders of stock, both equine and bovine, are proverbially opposed to the habitual exhibition of their animals, being unwilling to pander to what they regard as the idle curiosity of the urban public, who, being for the most part as ignorant about a horse's points as, in the late Sir Tatton Sykes' phrase, a cow is of conic sections, flock eagerly to every show at which hacks and hunters are to be seen, and are especially delighted if—a lady being preferentially in the saddle—jumping be added to galloping and trotting. There is undoubtedly something to be urged in support of the view that hunters, hackneys, roadsters, and thoroughbreds have only an indirect connection with farming operations, and that agriculture, strictly speaking, derives no benefit from the *exploitation* and perfection of any class of equine quadruped other than the draught horse. But it must not be forgotten that one of the avowed objects of the Royal Agricultural Society is to improve the live-stock of the United Kingdom, and therefore the Society's Council may be excused for opening widely the doors of their show-yards to animals which, viewed with an eye to agriculture, may be of

doubtful utility, but are nevertheless of the highest attractiveness to spectators, whose shillings and half-crowns contribute so materially towards defraying the enormous and inevitable expenses of these costly annual efforts. Perhaps the Council may to a certain degree be unconscious that a show conducted upon the Procrustean principle of bare and unrelieved utility—a show of horses, in short, from which everything except Clydesdales, Suffolks, and other animals of a like type should be rigorously excluded—would be in the highest degree flat, stale, and unprofitable. "I pardon something," said Mr. Burke, in extenuation of the American insurrection of last century, "to the genius of liberty;" and in like manner the Council of the Royal Agricultural Society cannot reasonably be censured for addressing themselves anxiously to the consideration of the knotty question how the non-agricultural public are to be drawn in shoals to exhibitions from which in too many cases they can derive no instruction, and which, if horses of high breeding and comely form were prohibited from competition, would lack those attractive elements of amusement which crowd the Agricultural Hall at Islington to suffocation each succeeding June.

It is, nevertheless, undeniable, first, that the most important classes of the Royal Agricultural Society's horse-shows are those devoted to stallions; and secondly, that the most important stallion-classes are those filled by agricultural and draught horses. Indeed, it may safely be asserted that such exhibitions of stock as that which took place last July at Kilburn, though in former days upon a much smaller scale, have within the last forty years—that is to say, since the Royal Agricultural Society held, in 1839, its first annual synod at Oxford—had an incalculable effect in improving and elevating the agricultural and draught horses of England; seeing that, within the lifetime of many who have as yet hardly reached middle age, competition and example have almost reconstructed the unwieldy and cumbersome quadrupeds by which, during the reigns of Her Majesty's three predecessors upon the throne, fallows were ploughed up, and the old broad-wheeled waggons, of which in his earliest books Charles Dickens has limned so many a speaking picture, were slowly tugged along præ-Macadamite roads. Nor is it to be denied that this valuable reform was actively stimulated by the ploughing-matches in which the great manufacturers of iron ploughs upon improved principles were eager to take part. Previous to 1839, the iron plough was but little used in England, and most of the ploughing was done by two or three horses in single file, led or driven by a plough-boy walking beside them at a snail's pace, and holding in his hand a whip, of which the resounding crack carried little

terror to the drowsy ears of his quadrupedal companions. In Scotland, on the other hand, the rule was an iron plough, and a ploughman briskly driving a pair of horses abreast. The Royal Agricultural Society's shows very soon brought the Scotch system of ploughing across the border, not, however, without strenuous resistance on the part of ancient British prejudice, as exemplified by the well-known story of the late Sir Robert Peel's tenants. The great statesman had presented an iron plough to each of the farmers holding land under him, and, after a year's experience, he called them together and pressed them to give him a candid opinion as to the merits or demerits of the innovation. "Well, Sir Robert," said, at last, the spokesman of the party, "we have tried your plough fairly, and we are all agreed that it makes the weeds grow."

After the Show of 1839, the respective merits of the iron ploughs from the establishments of several old and of some new manufacturers were hotly compared, while the introduction of wheels—a purely English invention—added to the keenness of the discussion. It so happened that the principal plough-makers of Ipswich, Bedford, and Grantham were also great lovers and experienced judges of horse-flesh; nor were they long in discovering that, in order to do justice to the merits of a good plough, it was vitally necessary to have a pair of nimble plough-horses, solid in substance and with first-rate action, and also a handy and skilful ploughman. Thus it came to pass that every show of the Royal Society afforded opportunities for a series of lessons as to the value of well-constructed ploughs, and of suitable plough-horses. The demand for superior draught-animals was, about forty years ago, stimulated by the increased pace at which all farming operations were performed; and, moreover, in consequence of the quickened movement of goods resulting from the wide extension of railways, it has been found that heavy vehicles, such as vans and coal-carts, which formerly never went out of a walk, are now compelled to move at a trot, so that mere size and weight in the horses, without action attached to them, have become an anachronism.

Draught-animals at the Royal Shows are now divided into three tribes—Clydesdales, Suffolks, and "Agricultural horses not qualified to compete as Clydesdales or Suffolks." It will be obvious at a glance that the description of the third or last-named tribe is in the highest degree vague, and it is probable that it will be further subdivided at an early date into "Shire horses, and others not competing as Clydesdales, Suffolks, or Shires." This division into tribes, including Scotch horses, is of comparatively modern date. When, in the latter half of the

last century, Arthur Young made his agricultural tours, he only mentioned two kinds of plough-horses—the first being the great black dray-horse, bred in Lincolnshire, Leicestershire, Northamptonshire, and the midland counties, and the second being the Suffolk Punch. At this point we come across the track of Bakewell of Dishley—*clarum ac venerabile nomen*—who took in hand the old black cart-horse, called in the fen country "the Shire horse," and brought to bear upon his improvement the same energy and intelligence which had created the breed of Leicester sheep, which had so refined the ancient long-horned ox that his immensely bony fabric has practically been improved off the face of the earth, and which finally achieved not a little towards the production of a respectable farm-yard pig. Nevertheless, it is certain that Bakewell's black horse, even with the infiltration of fresh Dutch blood into his veins, was, although an improvement, far from being a success. Thus we find that, writing in 1800, Parkinson—the ancestor of the late Mr. Milward, of Thurgarton—pronounced sentence upon this animal, declaring that "Mr. Bakewell was thinking too much of a fat ox when he selected the breeding stock for his black horse."

It is not without interest here to remark, that "the old Norman cart-horse," as we profanely call him, owed his origin to that "age of chivalry" which has so largely affected most of our British institutions, and which, despite the epitaph pronounced over its grave in the last century by Edmund Burke, still survives among us in many of its fairest features. When every man who was "armiger," or "esquire," was bound, after the Norman conquest, to find horses equal to carrying a knight in full armour, and proportional in number to the amount of acres that he held, it was natural that animals should abound as colossal in their dimensions as the pair which dragged the Speaker's state-coach to St. Paul's Cathedral upon the day of public thanksgiving for the recovery of the Prince of Wales from desperate sickness in the February of 1872. It has been estimated that the feudatories in Doomsday Book kept at least 100,000 stallions of cart-horse proportions, and it is indisputable that these massive animals, whether raised in the midland fens or imported from Normandy, must have produced a marked effect upon the native breeds of the country. Up to the end of the seventeenth century, draught agricultural operations were in the main carried on by oxen; but after that date the substitution of equine for bovine labour was rapid and progressive, although men of such different temperament as Arthur Young and William Cobbett never ceased to protest against the change. Now-a-days, enlightened British farmers would as soon

think of ploughing with oxen as of scratching the surface of their fields with a harrow tacked on to the long tail of a ragged pony, after the fashion portrayed in the title-page of 'Paddiana.'

Enough has already been said to show that within the last half-century the amelioration of the English cart-drudge has been rapid and unintermittent; and if the International Exhibition of horses at Kilburn is entitled to the fame which many unthinking, and a few thinking, writers have lavishly bestowed upon it, as being the grandest display of equine stock that the world has hitherto seen, sober after-thought will, there is little doubt, ultimately decide that it is upon the superiority of the cart-horse classes that this claim to pre-eminence must be based, in order to meet with general acceptance from the most competent judges. There are many reasons, to some of which brief allusion will hereafter be made, why large numbers of thoroughbreds, of hunters, and of first-class hackneys are never likely to be brought freely into the show-yard. But competitive examinations between heavy draught-horses, although at one time less encouraged by attention from the Royal Agricultural Society than was happily the case at Kilburn, are among the fundamental *raisons d'être* which have called local agricultural shows into existence, and which demand unceasing support from the parent society in Hanover Square. One of the first authorities upon the subject, Mr. Frederic Street, has lately remarked that "cart-horses have not hitherto received so much attention from the Royal Agricultural Society of England as some of the more favoured classes of cattle: for instance, at the recent meeting held at Bristol, the total amount given in prizes for all breeds of cart-horses—viz., English, Clydesdales, and Suffolks—was 475*l.*, while the Shorthorn cattle alone had a prize-list of 495*l.*" The amount given away in money-prizes to the horse-classes at Kilburn left nothing to be desired on the score of generosity, but, at the same time, exception has in some cases been taken—and in quarters, moreover, which command the highest respect—to the selection of Class 13—"Thoroughbred stallions suitable for getting hunters"—as the exceptional recipient of the highest prize—to wit, 100*l.*—while only half that amount was offered in the classes for Agricultural stallions. It is true that there were nine classes for cart-horse stallions, in each of which 50*l.* was awarded to the taker of the first prize; but the single class of thoroughbred stallions for getting hunters appeals to a far narrower circle of farmers than those for Agricultural stallions; seeing that, according to the evidence given before Lord Rosebery's Horse Committee in 1873, it is certain that even the high prices obtainable for a first-rate article have failed to induce

tenant-farmers, as a rule, to try their hands at breeding hunters; and secondly, because no steps are taken by the Royal Agricultural Society to ascertain that the thoroughbred stallions entered for competition at their show-yards are available for farmers' mares at a fee within the compass of their owners' pockets.

For these reasons it appears meet and proper that in a Report which has nearly 700 animals of the equine species for its subject-matter, special and even exhaustive attention should be bestowed upon the three cart-horse divisions, whether English (so-called), Clydesdales, or Suffolks, which were beyond question unmatched for excellence in any other department of the horse-show, and which, in addition, possess and can never be divested of peculiar attractions for owners and cultivators of the soil. I propose, therefore, to take a rapid glance at the origin and development of each of the three cart-horse tribes represented in the Catalogue, deeming it none of my business to invade the province of the Judges in each class by critically comparing one animal with another among those exhibited for competition. The reports of these Judges, necessarily restricted, and more or less technical in their phraseology, are appended, and will speak for themselves; but in the 'Journal of the Royal Agricultural Society' a loftier aim should not be lost sight of. There are few now living to remember that at the first banquet of the Society in 1839, with the late Earl Spencer in the chair, Daniel Webster, perhaps the most famous orator that the United States have ever produced, was present as a guest, and that in the words affixed to the striking speech then delivered by him, and inserted in the first volume of his collective works, "he made a deep impression upon those who heard him." Mr. Webster's flowing eloquence contrasted strangely with the hesitating and involved sentences of Lord Spencer, whose style of speaking in the House of Commons, subtracting nothing from his great and deserved influence, is elaborately described in Mr. Greville's famous Memoirs; but it cannot be inappropriate at this moment to recall that, upon the night of its inauguration, the Royal Agricultural Society was consecrated to high and ambitious purposes by an illustrious visitor "from that great country, whose people," as Lord Spencer remarked, "we are legally obliged to call foreigners, but who are still our brethren in blood." Upon that memorable night Mr. Webster elevated the three thousand agriculturists who heard him, to a nobler conception of their calling than they had theretofore entertained; and "in concluding with the most fervent expression of his wish for the prosperity and usefulness of the Royal Agricultural Society of England," he laid, as it were, an embargo

upon it for all time that "Practice with Science" should never cease to be its inspiring motto. It is not alone in improving and perfecting implements and in analyzing soils that science comes into play, for nothing is more certain than that there is a science in breeding horses no less than in maturing steam-ploughs; nor is the day, probably, far distant when there will be a further development and application of the horse classes exhibited last July at Kilburn, which, in Mr. Webster's words, "will be felt upon the rich pastures of the Ohio and its tributary streams." English horses—and none more readily than Clydesdales and Suffolks—find an ever open and inexhaustible market in the United States; and while our American kinsmen have created by their ingenuity a class of trotters unapproachable in excellence, they are treading closely upon our heels with their thoroughbreds, and have already expressed a determination to increase the trotting capacities of our heavy draught-horses, so as to make them available, like the Percherons driven in his brougham by the late Emperor of the French, for lighter vehicles than they have ever been attached to in the land of their birth. The three recognized tribes of the British cart-horse possess, therefore, even more interest for our American, and, by parity of reasoning, for our Australian brethren, than for older nations; and this consideration has determined me to hazard a few remarks upon their origin and development, together with some reflections, showing how important it is that each tribe should have its own Stud-book, so soon as it admits of distinctive classification.

Agricultural Horses.

It will be understood, *in limine*, that this title includes all those draught-horses shown at Kilburn which were neither Clydesdales nor Suffolks. "In making our report of Agricultural horses," say the three Judges apportioned to the task, "we beg to congratulate the Society upon the quantity and quality of entries in every class, except Nos. 36 and 37." Never was congratulation more merited; for even though no other live stock had been visible at Kilburn, *connoisseurs* would have been rewarded for their visit by the opportunity afforded to them of inspecting the 109 Agricultural stallions, and still more numerous Agricultural mares, entered in response to the invitation of their hosts. The size of these classes, indeed, as compared with those comprising the Clydesdales and Suffolks, sufficiently establishes that a further division and more discriminating analysis of British cart-horses will shortly take place. It is notorious that a decision has already been arrived at to found a

stud-book for English cart-horses, similar to the volume which has already appeared, thanks to Lord Dunmore, in connection with Clydesdales, and to another which, before these words are in print, will probably be published by Mr. Herman Biddell and Mr. Arthur Crisp in connection with the Suffolk breed. Assertions have been plentifully made that the pedigrees of several celebrated Shire horses—such as "Honest Tom," which in its day was the best animal of this type ever exhibited—can be traced back for nearly a century; but when the varied colours of "the Shires" are taken into consideration, it may fairly be doubted whether there be not in most of them a large infusion of recent Flemish blood. For it must never be forgotten that the Flemings were the first European farmers who took to ploughing with a pair of large horses, driven curricle fashion. Mr. Street, it may be remarked, traces the best existing "Shires" back to the old English black horse, upon whom Bakewell strove to graft improvements; adding that while the best colours are bay and brown, some few breeders prefer chestnuts, greys, and roans, with an occasional partiality for the parent colour, black. This same eminent authority tells us that an Agricultural horse should possess "feet firm, deep, and wide at the heel; the pasterns not too long or too straight, the bone flat and short between knee and fetlock. A stallion should not measure less than 11 inches below the knee, with a girth from 7 feet 9 inches to 8 feet 3 inches. He should not stand more than 17 hands; should have wide chest, shoulders thrown back, head big and masculine without coarseness; full flowing mane; short back, with large muscular development of the loin; long quarters, with tail well set on; good second thighs; large, flat, clean hocks; plenty of long silky hair on legs; or, to sum up in a few words, a horse should be long, low, and wide, and thoroughly free from hereditary disease. A main point is action; for he should be a good mover in the cart-horse pace, walking; and if required to trot, should have action like a Norfolk cob."

It would be well if all breeders of cart stock, whatever their breed, should keep before them Mr. Street's definition of a good horse; nor is it unsatisfactory to reflect that England at this moment possesses not a few good specimens of a race in which no other country has approached her. Our farmers are, as a rule, wealthy, our roads excellent, and our hereditary landowners patriotic and enterprising up to the point of spending their money freely, without hope of fee or reward, in order to lead the way in every stock-raising improvement. But although the British cart-horse, in the widest sense of the term, has now no equal in the world—indeed it may even be said of him that

nec viget quidquam simile aut secundum—it must not be forgotten that he is, to all intents and purposes, as much an artificial exotic as the Anglo-Arabian thoroughbred. His ancestors were imported partly by the Norman army which accompanied the Conqueror to Sussex, partly by the Flemings, who settled first on the borders of Wales, and secondly, at a much later date, in the fen districts. The war-charger of the Norman knight was, in point of fact, a cart-horse; and even in the reign of Richard Cœur de Lion, Sir Walter Scott—who upon such topics was as accurate as Leland—makes the charger ridden by Sir Kenneth of Scotland in 'The Talisman' so weighty and massive that the good steed is scoffed at by the Saracen Sultan, as "an animal which sinks over the fetlock at every step, as though he would plant each foot deep as the root of a date-tree."

In what manner, and by what slow evolution, such an animal as Lord Ellesmere's "British Wonder" was created out of living materials, which, if ever an aboriginal breed of cart-horses existed upon earth, came probably from the Low Countries, will never be satisfactorily and exhaustively traced by human pen. It is, however, my fixed belief that not until within the last century was any marked advance made by Englishmen in the improvement of our cart-horse breeds. Soil and climate in these islands were undoubtedly favourable to the well-being of heavy horses, and it is claimed with pride by the inhabitants of the Cambridgeshire and Lincolnshire marshlands that within five-and-twenty miles of the city of Ely the best cart-horses in the world are foaled and reared. From this fountain Lord Ellesmere has derived much of the Worsley stud, which wrote its name in such deep and ineffaceable characters upon the annals of the International Horse Exhibition at Kilburn, and which richly deserved the prizes bestowed upon it, because its young and spirited owner has never hesitated to give enormous prices for animals attractive to his fancy. In this manner Lord Ellesmere gave 750*l.* to Mr. Street for "Samson"—the sire of "Samson II.," "Samson III.," and "Samson IV."—which, like Mr. Wiseman's "Honest Tom," Mr. Taylor's "England's Glory," Mr. Seward's "Major," and Mr. Marston's "England's Wonder," was foaled within the charmed radius of which Ely is the centre. The Worsley stud—which, starting under the able management of its owner's agent, Captain Heaton, in 1874, has up to the present time taken nearly two hundred and fifty prizes—stands perhaps in the same ratio to English cart-horses, including "Shires," which is occupied by Lord Falmouth's stud at Mereworth in relation to thoroughbreds. At Kilburn, Lord Ellesmere made thirty-four entries in the "Agricultural Horse" classes, and obtained four first prizes, three seconds, three thirds, and

two champion cups; nor were there wanting some exceedingly competent judges who opined that some further prizes were wrongfully withheld from the Worsley stable. The English cart-horse has indeed a great future before him. Thirty members of a council created to do him honour, with Lord Ellesmere as President and Lord Spencer as Vice-President, have resolved that he shall have a Stud-book of his own, in emulation of those belonging to his Scotch and East Anglian rivals; and whether, in accordance with Mr. Walter Gilbey's wishes, the name of "Shire horse," or, in accordance with those of others, the name of "English cart-horse," be adopted, it is not to be denied that no distinct breed of equine or bovine stock ever attains, in the highest sense, to a recognized existence, until it has a stud or herd book of its own. Where, it may well be asked, would our British thoroughbred be, if the General Stud-book—containing, in the words of the preface to its first volume, "a greater mass of authentic information respecting the pedigrees of horses than has ever before been collected together"—had not been commenced in 1791? The Agricultural Horse classes at Kilburn, both in quantity and quality, were worthy of the occasion which brought them to the spot; and if, finally, I assign the palm to the mares (with special mention of "Poppet" and "Honest Lady") and fillies therein, rather than to the stallions, I shall but be following the general voice of criticism, which pronounces that England excels in cart-mares and Scotland in cart-stallions.

The Judges have reported as follows:—

In making our Report of Agricultural Horses we beg to congratulate the Society upon the quantity and quality of entries in every class except Classes 36 and 37.

Class 1—*Agricultural Stallions Four Years and upwards*—was as grand a class as need enter a ring. No. 22, the horse awarded first prize, is a grand horse, full of bone, feather, and quality, and looks like doing good service at the stud. No. 11, second prize, a very nice horse, active, with splendid feet and good top. No. 27, third prize, a fine upstanding horse. Nos. 29, 21, 3, 5, 12, five very good horses.

Class 2. *Three-Year-Olds.*—A grand class; if anything, excels the older class. No. 45, first prize, a grand colt, fine mover, and good feet, with splendid top, and well ribbed, and every chance of obtaining honours in the future. No. 44, second prize, a very good colt. No. 49, third prize, a very good colt. Nos. 43, 56, 46, good colts.

Class 3. *Two-Year-Olds.*—A good class. First prize, No. 72, a very good colt, splendid action. No. 85, second prize, a good colt, with good bone and feet. No. 69, a very improving colt, nice hair, with plenty of bone, and good action. Nos. 81, 68, 60, 62, 80, five very useful colts.

Class 4. *Yearling Colts.*—This class, with few exceptions, does not equal the three preceding classes. No. 106, first prize, a good colt, with splendid pastern-joints, and likely to be a prize-taker in the future. No. 97, second prize, a nice colt, with good action. No. 105, third prize, a promising colt, good bone, with lot of hair, but low in condition. Nos. 89, 96, 98, 102, 103, five useful colts.

Class 18. *Mares and Foals.*—An extraordinary good class. No. 280, first prize, a grand-looking animal, very wide, good action, plenty of substance and quality. No. 281, second prize, a fine animal, good action with quality. No. 284, third prize, a good wide mare, with plenty of bone and hair. Nos. 285, 286, two good animals; and the whole class worthy of commendation.

Class 21.—No. 334, a very nice filly, full of quality. No. 321, a nice active filly. No. 335, a filly with good hair and bone. No 326, an upstanding filly.

Class 24.—No. 350, a nice filly, full of quality. No. 356, an active filly. No. 359, a wide filly, with good action. Nos. 357, 364, 368, fair-looking fillies.

Class 27.—No. 410, a good-sized wide filly. No. 404, a good-looking filly. No. 415, a nice filly, good bone and hair, and low in condition. No. 414, a fair-looking filly.

Class 34.—A very good class indeed. No. 466, a grand pair of geldings, good match. No. 469, two grand mares, but not so good a match. Nos. 465, 467, 468, three very good pairs.

Class 35.—A very good class indeed. No. 476, first prize, a splendid gelding, with fine action. No. 478, second prize, a great, strong, useful animal. No. 475, third prize, a thick, useful animal. Nos. 480, 479, 481, commended.

Class 36.—A weak class, nothing special.

Class 37.—No entry.

Class 38.—A grand class of seventeen entries. No. 497, first prize, an extraordinary mare, full of quality, and fine mover. No. 492, second prize, a grand mare and fine mover. No. 494, third prize, a mare full of quality. Nos. 493, 485, 495, 496, 501, all good mares.

William Thomas Lamb.
John Lewin Curtis.
Alexander Turnbull.

Clydesdales.

It would not be easy for the breeders interested in this valuable tribe—of which 37 male and 43 female specimens, both sexes being of rare excellence, were entered at Kilburn—to overestimate the debt of gratitude due to the Earl of Dunmore for the retrospective volume of the Clydesdale Stud Book, which is the result of his research and labour. The able compiler modestly acknowledges his obligations for the assistance received by him from the members of the Editing Committee, and from other Scotch gentlemen whose names he enumerates; but they would be the first to confess that credit must in this connection primarily be rendered to the noble lord himself. The Clydesdale breed is the result of very careful selection of native and of English horses for nearly a century, and its present excellence is undoubtedly attributable to the fact that in the eighteenth century Scotch farming and ploughing were far in advance of those prevailing in any other part of the United Kingdom; and such being the case, the intelligence of Scotch farmers in the district from which the tribe takes its name, addressed itself readily to the

task of developing and maturing it. Lord Dunmore notices the tradition that about the year 1650 the then existing Duke of Hamilton introduced six fine black stallions from Flanders into the valley of the Clyde, and crossed them with native Scotch mares; but he proceeds, upon the authority of Aiton of Strathaven, who wrote about the year 1810, to throw doubt upon the authenticity of a report which must be regarded with suspicion. It is far more probable that Clydesdales are a composite or made breed, arising from the union of Scotch mares, nimble of leg as quadrupeds always are in a hilly country, with selected specimens of the English cart-horse. The Upper Ward of Lanarkshire is probably the cradle of the race; and Lanark fair, held annually on the Wednesday before August 12, was the principal market to which the colts were brought to be disposed of. In former days, according to the Rev. David Ure, these yearlings were generally purchased, at prices varying between 5*l.* and 20*l.*, by farmers from Renfrewshire and Ayrshire; and having been thoroughly trained for draught purposes, they were resold, when five years old, at Rutherglen fair, fetching from 25*l.* to 40*l.* a-piece. It would indeed astonish the originators of this remarkable breed could they be awakened to a consciousness that within the last few years prize-winning yearling fillies have been purchased eagerly at 150*l.* to 200*l.* a-piece; that a first-class brood-mare is occasionally marketable at 500*l.* or more; and that stallions have been known to fetch 1500*l.* The surprising rise in price is probably due in great measure to the eagerness with which a demand for Clydesdales has sprung up in Australia and New Zealand, as is evidenced by the heavy purchases made recently, at Lord Dunmore's sale and elsewhere, by Mr. Russell; while simultaneously the United States and Canada have sent many emissaries to England, with a view to possessing themselves of the breed. It is said that the appreciation of Clydesdales in the United States was greatly enhanced by the strain thrown on American railroads during the stupendous Civil War which raged between 1861 and 1865, and necessitated the movement of enormous masses of war material. It was found, in practice, that no other horses were so handy for tugging railway cars about the vast stations or depots of New York, Philadelphia, Baltimore, and Washington; and since the war there has been no decline in the demand, or in the price paid, for shapely well-bred animals from the Clyde valley. As a rule, the shoulder of the Clydesdale is more slanting than that of the English cart-horse, and, moreover, the generous courage and high spirit with which the Scotch quadrupedal drudge sets his shoulders to work when called upon to drag a load of three tons up the "Glasgow slips," secures for him the distinction that no

such large sums have ever been given for any other breed. There was a time when Clydesdales were accused of being leggy, and not well ribbed up; but the reproach has been taken away by judicious crossings with Shire mares. The breed is remarkable for size and activity, and for its power of trotting with great loads, so as to make it invaluable for railway carriers. The Highland Society's shows have largely contributed to its improvement; and in May last it was stated, in the 'Kirkcudbrightshire Advertiser,' that "Kelso Maggie," a prize-winning Clydesdale mare, which carried all before her as a 3-year-old at the Scottish National shows of 1876, had been sold to Mr. Angus, of Australia, at the unprecedented price, for one of her sex, of seven hundred guineas. The turn-out at Kilburn was, indeed, small in numbers when compared with those often exhibited together in Scotland, but, *en revanche*, the English show in July last boasted the very flower of the breed. The Scotch specimens triumphed deservedly at Kilburn over their English rivals, nor would it be easy to find a more faultless animal of the kind than the "Druid," which won the first prize for aged stallions, and also carried off the Champion cup. The breed possesses the inestimable advantage, soon to be shared by its English rivals, of a Stud-book, and, in addition, the admirable essay from Lord Dunmore's pen has done for Clydesdales what it will tax the powers of English writers to do equally well for Suffolks and Shires.

The Judges delivered the following Report:—

1. *Stallions Four Years old and upwards.*—The first and second horses were very superior animals, the first horse having more substance, and very deservedly obtained the premium-ticket, and afterwards easily won the cup.
2. *Stallions Three Years old.*—The first three were very good specimens of the breed.
3. *Two-Year-Olds* were a very good class, the first-prize one being an animal of great substance and quality.
4. *The Mares and Foals* were very good as a lot, the first premium being an animal of very superior quality.
5. *Three-Year-Old Fillies.*—The first three were excellent specimens, and were close to each other in points of excellence.
6. *Two-Year-Old Fillies* were a magnificent show, and were topped by a very superior animal, which also won the cup in the Mare Classes.

JOHN YOUNG.
JOHN THOMPSON.
ADAM SMITH.

SUFFOLKS.

The Suffolk is a very ancient tribe, and possesses the great attraction of a uniform colour in various shades, and of having long been the object of improvement by local patriotism, which has so elevated and ameliorated it as to get rid of the outline

of the original little stocky Suffolk Punch, while retaining his colour. Arthur Young, although pronouncing that "an uglier horse could not be viewed," described the Punches with rapture more than a century since (as was natural in a Suffolk-bred man); and it is promised, in the prospectus of the Stud-book which is about to appear, that it will contain pedigree charts of Suffolk horses genealogically traced for one hundred and twenty years. The breed was once in such favour with the amateur farmers who constituted the Council of the Royal Agricultural Society that a majority of prizes was awarded to it. In those days weight was undervalued, but a change in public opinion soon supervened, and the importance of bulk was made manifest when the value of deep ploughing with double shares was firmly established, and when it was found that a profusion of silky hair on stout legs was an unerring index of constitution. One of the original merits claimed for the breed was that animals belonging to it were active and able to trot, which made them peculiarly useful for certain classes of work; while, on the other hand, it was imputed to them for a fault that they were soft, and apt to become lame when forced habitually into a trot. Within the last forty years, however, the weight and size have undergone a marked improvement, and simultaneously the activity has been retained and soundness insured by the severe and unsparing comments made in the show-yards by local breeders upon the defects of the animals exhibited by their rivals. No breed has derived more advantage from country shows, as is attested by the following extract from a singularly lucid essay printed in the 'Live Stock Journal Almanack' of 1878, from the pen of an eminent authority, Mr. Herman Biddell:—

"Emulation, competition, a laudable pride in producing better horses than others possess, stimulated the earlier breeders, as it stimulates their successors of the present day. The show-yard has done wonders for the breeds of horses all over the kingdom, but in no county has the rivalry of the prize-ring been taken up with more spirit or with greater success than in Suffolk. Long before the institution of the agricultural shows, which have since been extended into such gigantic exhibitions, there were men in Suffolk who knew what the form of a horse should be; could see faults in their own, and had watched what others were doing outside the borders of the county. They had long aimed at a type of horse, the number of which has been vastly multiplied, but the form of which has not been greatly exceeded. The early histories of the county describe the 'drawing-matches'—team against team with sand-loaded waggons—and in such tests no doubt the low fore end, the upright shoulder, and the

roached back told well; but the men who brought the Suffolk horse into notice beyond the sandy heaths where these exhibitions of strength and perseverance took place, had an eye for something adapted for a more extended utility. . . . . The large landowners in Suffolk are mostly breeders of the county cart-horse. Cottingham's 'Captain' was bought by the Duke of Grafton for the use of his tenantry, and left his mark in many a short-legged animal in the Euston district. Sir Edward Kerrison was always a good buyer, and won many prizes. The Marquis of Bristol's agent is always ready to pick up a promising one for the Ickworth stables, and at Bedford, in 1874, some of the prizes fell to Bristol entries. The Earl of Stradbroke's name may be seen in the prize-list of the present year. He was one of the founders of the Suffolk Agricultural Society as far back as 1831—eight years before the first show of the Royal was held at Oxford. Lord Henniker buys and breeds too. The late Colonel Wilson was by far the most successful exhibitor in the western division of the county, and did more in a few years than some of the old breeders have done in a lifetime. The Duke of Hamilton buys good ones, gives long prices, and sometimes wins with what he has bought. The tenant-farmers can, however, hold their own even against such names as these, and at present are in no danger of being beaten either at home or at the national meetings."

Numerically there have been finer shows of Suffolks than those exhibited at Kilburn, and it is noticed with regret by the three judges that "in some classes such a paucity of animals entered the ring compared with the entries." The stallions of all ages that were entered amounted in number to 40, and the mares and fillies to 37; but it was sagaciously observed by the 'Mark Lane Express,' that the classes have been so sifted by the horse-shows in Essex, Norfolk, and Suffolk, that only a selection met at Kilburn. On the whole, the exhibition at the last Royal fell far short of that which was seen at Battersea in 1862; and although the 14 Suffolk fillies shown at Kilburn in July constituted a magnificent class, which won special commendation from good foreign judges, it was not equal to that seen at Battersea, which numbered more than a score, and was perhaps the grandest display of the kind ever gathered together in the ring at home or abroad.

"Cupbearer III.," with which Mr. Garrett won the first prize at Kilburn in the Aged Stallion class, is perhaps the most successful Suffolk horse of the day, and has already won nearly 500*l.* in prizes. Barring his faulty and bent hocks, and plain quarters, he is about as good a specimen of his race as a good judge would care to look at. Nevertheless, the Judges at

Ipswich, in 1878, preferred Biddell's "Ben" to Mr. Garrett's horse, and awarded the first prize to "Ben," which also carried off the 100*l.* Saxmundham cup. Mr. Biddell, however, had speedy revenge for the defeat of "Ben" at Kilburn, when the Champion cup was presented to his noble two-year-old colt "Jingo," which also took the first prize in his own class, and has since been sold to the Earl of Onslow. With the exception that his legs seem a trifle too light to bear his immense carcass, "Jingo" might be accepted as a faultless Suffolk colt; and if ever our American kinsmen succeed in their endeavour to convert improved specimens of our cart-stock into brougham horses, it is upon the model of such colts as Mr. Biddell's "Jingo" and "Rodney," and Mr. Garrett's "Zulu," or upon such two-year-old fillies as Mr. Toller's "Duchess" and the Duke of Hamilton's "Yellow Diamond," that they will have to graft. It seems to me desirable, however, that the American practice of weighing prize horses, when exhibited for competition, should be introduced into England, as it would be of interest to know how, for instance, "Cupbearer III." and "Ben" compare in the scales with the best Aged Clydesdale Stallions, such as Mr. Buchanan's "Druid" and Mr. Riddell's "Darnley;" or again with similar specimens of the English cart-horse, such as Lord Ellesmere's "British Wonder," which weighs rather more than 2000 lbs. The increase in weight of these ponderous horses from two to three years, and so on, in each additional year, would be pregnant with suggestions to connoisseurs; and if any American animals had been exhibited at Kilburn, which we regret to say was not the case, their owners would, doubtless, have marvelled at the absence of the scales.

Mr. S. Wolton's three-year-old colt, "Renown," which was purchased for Her Majesty by Mr. Tate, has what in the county of his birth is considered the defect of white feet behind, which made it a matter of regret to local breeders that he should have been selected with a view, as it was understood, of being presented by his Royal purchaser to a friend. In the county of Suffolk the white leg and foot are rapidly disappearing, at the instance of such breeders as the veteran Mr. Frost, now verging on his eightieth year; of the Messrs. Wolton, who belong to a very old family of exhibitors; of Mr. Alfred Smith, a rising breeder, who was second at Kilburn with his "Abbot Samson," a first-prize winner at Lowestoft; and of the Messrs. Biddell Brothers, who from their adjoining farms at Playford sent eight representatives to Kilburn, and had the satisfaction of returning with three first prizes, two seconds, one third, and two commendations. Mr. Garrett, who won the first prize in that class with "Cupbearer III." (bred by Mr. Frost), was also the winner

of the second prize for mares and foals, and of the third for two-year-old colts, in addition to commendations. The Messrs. Toller, also, are famous for breeding horses of the true Suffolk type, and among them many good ones. The only prize-winner in this tribe which was bred outside of the county was Lord Howe's yearling stallion "Old Boy," which took the first prize; a victory by no means unwelcome to Suffolk men, seeing that Lord Howe comes straight to the breeders for his purchases, and does not repair to dealers.

The following is the Report made by the Judges:—

The general exhibition of Suffolk horses we consider to be most satisfactory as to merit, but it is to be regretted that in some classes such a paucity of animals entered the ring compared to the entries. Probably local Shows have brought many animals together, and opened the eyes of owners as to the comparative merits of their respective animals.

Class 9. *Stallions Four Years old and upwards*—produced the two most noted horses of Suffolk, "Cupbearer III." and "Biddell's Ben," whose respective merits have been very closely scanned upon several occasions. Mr. Garrett's "Cupbearer III." bears off the palm. Both these animals are excellent specimens of their breed, and are sure to leave their mark behind them in their progeny. No. 150 is third, another of Mr. Biddell's animals, a smart-looking horse with a good back.

Class 10. *Three-Year-Old-Stallions.*—No. 165 we place first. He is a very smart colt, and from his good looks promises to make an attractive horse. No. 163 is a very prime-looking colt, wide and strong; but not moving quite so freely, he loses the first place. No. 166 is third, a full-sized and very useful colt.

Class 11. *Two-Year-Old-Stallions.*—No. 170, Mr. Biddell's "Jingo." This is a colt of great attraction, and not only takes the first prize in his class, but we assign to him the Challenge Cup, a great honour, indeed, considering the formidable company he was in. This colt has an immense carcass for a two year-old; his feet are good, and his legs wiry, but perhaps they look scarcely big enough for his great weight. No. 169 is second, a colt of great promise, and looks like making a superior horse. No. 173 is third.

Class 12. *One-Year-Old-Stallions.*—These are not up to the mark, and we must refrain from remarking upon them individually.

Class 20. *Mare and Foal.*—Only four mares with their foals came into the ring, with ten entries. No. 308, Mr. D. A. Green's "Smart," takes the first prize. This is a remarkably well-shaped mare, and an excellent specimen of a Suffolk; we give her the Challenge Cup as well. No. 314 takes the second prize. This is a short-legged and very active mare, with an excellent foal by her side. No. 318 is third, a very attractive mare, and moves well. This mare ran very close for the second place.

Class 23. *Three-Year-Old-Fillies.*—No. 344 stands first. This is a short-legged filly, very good back, and very active mover, and altogether looks like making a good mare. No. 343 is second, a full-sized mare. No. 345 is third.

Class 26. *Two-Year-Old-Fillies.*—This was one of the most attractive classes in the Suffolk horses. The two-year-olds were in full force. No. 394 we place first, and if she gets of sufficient size will be a puzzle to some of the old prize-winners. She is very active, and a most symmetrical specimen. No. 393 is second, and No. 398 third. Both of these are attractive fillies, and move well; No. 392 is the reserved number. We highly commend Nos. 389, 390

and 391, and commend the whole class. It is almost invidious to remark upon them separately. They are a good lot, and we congratulate the Suffolk breeders. They (with their Stud Book in progress) are looking upwards, and evidently mean to uphold their favourite breed.

Class 29. *The Yearling Fillies* are not so attractive. No. 432 is first, with a useful filly; No. 430 second, and No. 428 third.

Daniel Sewell.
William Thompson.
Henry Cross.

Thoroughbred and Coaching Stallions.

These classes formed, beyond all question, a very attractive portion of the Show, and were scrutinized at Kilburn with an interest which attaches, especially in the eyes of the ignorant, to animals of comely form and elegant limbs. The selection of the prize thoroughbred stallion is left entirely to the discretion of the Judges; nor is it imperative that he should have riding action, or that the fee at which he is available should be within the reach of persons to whom it is a consideration, and who breed from half-bred mares. It has constantly happened—though such is not, I believe, the case with Mr. Vyner's "Duc de Beaufort"—that the magnificent prize of 100*l.*, added to the concomitant distinction bestowed by it, has fallen to a race-horse, totally unfit for country mares, who goes the round of shows, carrying away prize after prize, and then returning to the stud, where he is set to breeding racing stock from thoroughbred mares covered by him at thirty guineas, or even more, apiece. Again, as regards coaching stallions, it may fairly be asked, "What is meant by the term?" If one turns to the evidence given before Lord Rosebery's Committee, one finds that Mr. Thomas Parrington and Mr. William Shaw agree in stating that the so-called coaching stallion belongs to a very worthless class of animal. Mr. Parrington has been a master of hounds, and Secretary to the Yorkshire Agricultural Society, and his testimony in regard to bay Cleveland stallions—the progenitors of the true old breed of London coach-horse—is, "This is a class of animal that we do not encourage." Mr. Shaw, who followed the more humble calling of a stallion leader, confessed that he could not get a living by accompanying a Cleveland stallion about the country. Foreigners, who are great and spirited customers, refuse to buy a mare got by a coaching stallion out of a half-bred mare. It appears that the Royal Society should specify and describe the points it requires, and not leave exhibitors to send anything in this class that they please, while the Judges make their selections *à discrétion*, with no certain rule to guide them.

In the Thoroughbred Stallion class for getting hunters, it is

idle to expect that even a prize of 100*l.* will often attract to the ring such animals as "West Australian" and "Carnival"—I name two dead horses in order to avoid invidious comparisons—which were beyond all question well adapted for siring hunters, but of which the service fee was generally too high for any other mares than thoroughbreds. Among those actually exhibited, "Lingerer" looked more like getting park hacks, and "Curtius" was a scarecrow; while "Caterer," although the sire of one of the heaviest racehorses ever placed in the St. Leger, "Leolinus" by name, seemed more adapted for "across the flat" than for the hunting-field. The three best animals for the purpose required seemed to be the "Duc de Beaufort," "Make Haste," and "Tassel;" but by a country which, like England, has, in the words of an American trainer, "as many good thoroughbreds as there are pine trees in Virginia," it might have been expected that this class would be more largely and worthily filled. It is also expedient that the Royal Society should do its utmost to discourage blood in which the hereditary taint of roaring exists; and in the opinion of Mr. Mannington, as given before Lord Rosebery's Committee, the Stockwell and Melbourne strains are open to suspicion in this respect; while it is certain that "Wild Dayrell" has imparted to many of his descendants a tendency to knee-lameness, which is as transmissible as gout or consumption in the human subject, and should in the estimation of judges be fatal to any of his sons exhibited in an agricultural show-ring.

The revival of coaching in England, and the very large prices which have recently been given by the enterprising noblemen and gentlemen whose teams delight the eye each succeeding summer in Piccadilly and Oxford Street, render it important that the coaching stallion, no longer of the Cleveland type, should receive more notice and attention than has hitherto been the case. Those exhibited at Kilburn were a motley group; and if one of M. Edmond De La Ville's Anglo-Norman stallions had been entered for this class, he might not improbably have carried away the first prize. The winner, "Penzance," from Yorkshire—the property of Mr. Christopher W. Wilson—was a creditable Cleveland; and the third prize-taker, "Lord Beaconsfield," with less of the Norfolk trotter stamp than Mr. Burton's horse, which was second, has many admirable points. But the entire class is susceptible of considerable amelioration, and, with the attention to distinctive characteristics of which I have shown the desirability, it is to be expected that higher excellence will be attained in the future.

Hunters and Roadsters.

"The great Serbonian bog, where," in Milton's words, "armies whole have sunk," came to the minds of those experienced in the operations of war, as they reflected upon what would have been the condition of the Kilburn Show-yard upon Thursday and Friday, had the ground been cut up during the first four days by the passage of cannons, caissons, and commissariat waggons. The hunters, and especially the weight-carriers, profited more by the mud than any other class of horses exhibited, although it ought not to be forgotten that many a good run across country takes place in England when the ground is not heavier than at Newmarket upon an ordinary Cesarewitch day. The most perfect animal shown in this department seemed, in my eyes, to be the Lincolnshire-bred bay mare, "Snowflake," the property of Mr. George Leighton, of Osgodby, near Scarborough.

"*Et vera incessu patuit dea*," occurred to classical minds as a fitting description of this beautiful animal, which bore the blushing honours of many a previous triumph in the prize-ring thick upon her, to which she added another when the Judges attached the red riband to her head-stall without a dissentient voice. The class of "Hunters up to 15 stone," with twenty-four entries, was pronounced by Colonel Luttrell, Mr. J. B. Booth, and Mr. Hill—than whom it would not have been easy to find three more competent judges—as being "a good lot and out of the common;" nor was there any disposition among the many critical performers in the saddle who looked on to question their verdict. The weight-carrying hunters came from many different counties, but the North carried away the principal honours with Mr. Forster's "King John," from Northumberland, first; with Mr. Cecil Legard's "Blacklock," from Yorkshire, second; and with Mr. Andrew Brown's "Gambler," also from Yorkshire, which was commended. It is not, indeed, improbable, that Mr. FitzOldaker's bay gelding by "Voltigeur," which took the third prize, was also, to judge from his sire, raised in the North, but his breeder is unknown. Considering the value attached by wealthy owners of weight-carriers to their favourite hunters, it was hardly reasonable to expect that many of these gentlemen would risk their much-prized darlings in a show-yard, and therefore the class was undoubtedly not worthy of the occasion. Mr. Booth, after riding most of the hunters round the ring, pronounced that no horse carried him through the mud with so much power as "King John," although to some eyes he hardly seemed to "get away" in his action so well as Mr. Legard's

"Blacklock;" but in such competitive trials, the man in the saddle is more qualified than on-lookers to deliver judgment.

The "Hunter Mare and Foal class" was, with the exception of the faultless "Snowflake," hardly up to Royal form, and has often been surpassed at similar shows in the north of England; and the light-weight hunters were even more disappointing, although the entry was large. Yorkshire was again to the fore in this last-named class, with Mr. Brown's "Cockney," from Pontefract, which was first, and Mr. Rose's "His Majesty," from Malton, which was second, although it is but justice to add that he was bred in Cumberland. But, notwithstanding the average merit of the hunter classes, it is open to question whether more might not be done by the Royal Agricultural Society to teach farmers how to utilize their half-bred mares, so as to raise hunters from them capable of being sold at from 100*l.* to 150*l.* a-piece when rising four years old. An estimate of the expense to be incurred in breeding such an animal, together with the best markets to which, according to his qualifications, he ought to be sent, might well be furnished for the guidance of tenant-farmers by experienced heads; and this suggestion leads me to inquire whether the Judges appointed to pick out the four or five best animals in a class, adequately fulfil their functions when they decide how and where the red, blue, and orange ribands are to be bestowed, and do nothing further. In fact, is the principle of a race or competitive trial between the horses in each class the best system to be adopted under the circumstances? Take, for instance, the class for thoroughbred stallions capable of getting hunters, for which sixteen horses were entered. These sixteen specimens are sure to be used for getting hunters in one or other district, with the exception of those which, from the costliness of their fees, will naturally be confined to thoroughbred mares. Now, the number of farmers for whose use the three or four first-prize winners will be available is necessarily limited; which consideration leads naturally to the inquiry whether the reports of the Judges would not be much more valuable if, after awarding the prizes and the Champion cup, and distributing their commendations, they were to mention by name every horse that possesses merit as likely to get good foals, and were to omit all notice of others, which by implication would be branded as mischievous. At present, one of the results secured by the existing system is, that horses are reared and trained by experienced riders solely with a view to catching the eye, so as to win prizes. We are all of us familiar with many instances in which professional exhibitors travel the round of the shows; and although there is nothing censurable about the victories of these veteran champions of the show-yard, whether in the

guise of stallions which rarely or never get a hunter, or of hacks too costly to be elsewhere exhibited, or of hunters that were never hunted, it seems to me that the money thus lavished upon prizes might in several ways be made more extensively useful; as, for example, by the addition of a *catalogue raisonné*, or tabulated order of merit, to the reports of the Judges, and furthermore by deferred prizes to mares likely to breed valuable stock. As matters now stand, the classes for mares with foals are unquestionably full of interest, but the entries therein are so scanty, that it may fairly be doubted whether they deserve the three prizes apportioned to them. This remark applies specially to the hackney mares and foals, and to the pony mares and foals, in both of which classes there were not half as many entries as are often seen at Yorkshire shows. The definition of a hackney, or roadster, differs essentially, when drawn by a Yorkshire hand, from that given by a resident of Devonshire or South Wales. "Enduring hacks of the old sort," says the author of 'The Book of the Horse,' "are now only to be found in the hands of active farmers, who look over hundreds of acres before breakfast; of country surgeons, human and veterinary; of maltsters, and of men belonging to a few other callings which take their followers out of the main tracks on to short cuts and bridle-roads. In pasture countries, the young farmer fond of riding usually prefers something better than a roadster—one that will grow into money. But the majority of modern farmers prefer wheels, or are generally satisfied with anything useful that will do their day's work—very different from the time when a good roadster hackney was worth as much as, and was more carefully chosen than, the modern brougham horse." Hackneys, cobs, and ponies seem to me, in relation to the ordinary requirements and the habitual productions of horse-breeding farmers, to belong to what our French neighbours call *classes de fantaisie*, and therefore call for no critical analysis in a report specially designed to invite notice from agricultural raisers of equine stock.

Coach Horses.

Among those included in the Kilburn Catalogue, no class was more disappointing than this, as regards the number of the entries. The prize of 25*l.* for "coaching mares or geldings above three years old, suitable for omnibus work," was offered by the London General Omnibus Company—an association which, thanks to the administrative energy and sagacity of its able manager, Mr. A. G. Church, well deserves the attention of those to whom the War Department assigns the onerous task of supplying the army with artillery and commissariat horses. In

his valuable evidence before Lord Rosebery's Committee, Mr. Church stated, in March 1873, that nearly all the horses employed by his company came from abroad, for the simple reason that they could not be obtained at all in England. "It is not an affair of price," he said, "but of absolute scarcity." The average price per horse had risen from 23*l.* in 1866 to 34*l.* in 1873; and in the last Report for the half-year ending June 30, 1879, I find that the average cost of their horses, notwithstanding the universal depression of prices, had risen to more than 39*l.* Replying to a question from Lord Rosebery as to any possible remedies for increasing the supply of English horses in this class, Mr. Church said, "The only remedy that I have heard of which strikes me as at all feasible, is that encouragement should be given to farmers to breed horses." Six years have since passed; and in the last Report, from which I have just quoted, it is stated that, although there has been no reduction in price, "the supply of English horses has so much improved, that the company have had no difficulty in obtaining all their requirements from the English market." This is, undoubtedly, a statement of great value; but I dare not flatter myself that within the last six years there has been any marked increase in the production by English farmers of omnibus horses, much as I should wish to believe it. The truth probably is, that by reason of the general economy necessitated by hard times, which have compelled so many broughams, phaetons, and carriages to be given up by the middle classes, the purchasers employed by Mr. Church have been exposed to much less severe competition. Judging by the official returns, the number of horses in England of this class remains about the same, but there is much less demand for them than in 1872 and 1873, and thus they have fallen sufficiently in price to come within the purchasing powers of the London General Omnibus Company.

Now it is undeniable that if, in conformity with Mr. Church's suggestion, English farmers could be encouraged to breed horses of this class, it would, on patriotic grounds, be a great boon to England. Many of the omnibus horses seen in the streets of London and other large English towns are precisely of the class wanted for our artillery, but war upon a large scale would at once drive us once more for a supply to the foreign market. Happily there is, in the United States and in Canada, an almost inexhaustible reserve of animals adapted for this purpose; but in case of a large and sudden demand, prices would instantly be raised against us. It seems to me that the Royal Agricultural Society would be discharging a wise and beneficent office if they were to expunge from their equine Prize-sheet some of the fancy classes, and to hold out inducements to farmers to devote

their earnest attention to raising animals of this type. That such is not at present the case may, I think, be inferred from the scanty entries made in Classes 45 and 46—to wit, one coaching mare, not of high quality, in Class 45, and seven animals in Class 46, of which five were sent by the London General Omnibus Company itself, two of them being, in my own opinion, preferable to the worn and wind-galled animal, with hunting rather than coaching action, to which the solitary prize was awarded. These same remarks apply to coaching stallions, which, as has already been remarked, are left to chance, unguided by a precise specification of the characteristics required in them.

The following are the Reports of the Judges for the classes named :—

Thoroughbreds and Hunters.

Class 13. *Thoroughbred Stallion.*—It is not surprising that, in the best exhibition of horses ever held in this country, the thoroughbreds should have been much above an average. Out of sixteen entries fourteen appeared in the ring; and although some of these, as is always the case, held no pretension to the condition of the prize sheet, the majority, taking them as a lot, are calculated to do good in their generation. No. 195, "Duc de Beaufort," by "Ventre St. Gris," dam, "Dame d'Honneur," by the "Baron," of good stout blood, was placed first. He is a very level horse, long and low, on good legs, and an excellent mover, walking away all over a hunter; whilst he cannot be called a big horse, everything about him is good. No. 200, "Make-Haste," by "Tom Bowline," a son of the "Flying Dutchman," out of "Makeshift," by "Voltigeur," another good staying family, one of the Glasgow lot, ran a close second. His good legs and rare bone must make him a valuable hunting sire, and had he been as truly formed as his rival, the two chestnuts might have changed places. At any rate, the county of Monmouthshire is to be congratulated in having such a good animal at its command. No. 204, "Caterer," by "Stockwell," dam, "Selina," by "Orlando," an unmistakable gentleman, took the third honours. His fine quality, powerful back and loins and true action, are sure to put him in the first rank as a hunting sire. No. 201, "Tassel," by the "Drake," a horse of good substance and character, got the reserve number. He looks a bit light now, but, having been only a short time out of training, he will thicken and tumble into a useful sort for country work. No. 191, "Lingerer," a son of "Recluse," by "Loiterer," a taking-looking one, with very good action, but rather weak posteriors, got a commendation; and so did No. 203, "Merry Sunshine," by no means a bad animal, though somewhat cramped in his action. A Frenchman, No. 189, "Soubait," appeared in this class, and although he moved with great freedom and force, he was not a match for the others, and would have stood a much better chance in the opposite ring with the hackneys.

Class 30. *Hunter Mare and Foal.*—Rather weak for the Royal, and not so fully represented as in former years. The winner, however, No. 438, "Snowflake," is a beautiful mare, with plenty of blood, substance and length. Her foal by "Landmark" was a backward one, and hardly did her justice. No. 445, "Evangeline," being brought into the ring late, by a narrow squeak walked in for the second. She is all quality, and looks like breeding a speedy one; she would be improved by having a little more substance. No. 437, "Minerva," lacks breeding, but ought to produce something up to weight, if properly mated. No. 435, "Battlement," a well-bred one, with moderate shoulders, had the reserve number.

Class 39. *Hunter up to* 15 *stone.*—Out of the common; a good lot, with twenty-five entries, comprising many which had previously carried off the ribbons. No. 506, "King John," was our pick. He would be hard to beat in any company, for with plenty of breeding there is no lack of power; his good short legs, back and loins like a lion, and excellent second thighs, put him well over the prescribed weight: then he moves in all his paces, and gallops strong and well, with a leg to spare, which is no little advantage over rough ground. His shoulders might be finer, but they are well laid, and the sweating process would go a long way to rectify this, as he has evidently been done well for the occasion. No. 520, "Blacklock," the champion at the Alexandra Park, is also a grand horse, but not up to the weight of the other. There was not much to choose between them when they were going; this horse, for a tall one, moving lightly and with great liberty; yet he did not show as well as at the Park, evidently being amiss with a bad cough. No one can find fault with his breeding; he has a lot of blood and shows it, but, when stripped, he had not the back and loins of his rival, and hardly looked up to 15 stone; so he got the blue ribbons. No. 524, by "Voltigeur;" a fine specimen of a weight carrier. He galloped in great style, and went as if he could do a lot of it. Though the other two had the pull of him in age, his legs are good enough to see the end of many a good run with the best of them. No. 526, "Gambler," by "Knave of Hearts," turned up a trump by speculating at the rails, which he did cleverly sideways. If he gets over a country like this he will prove himself the good hunter he looks. No. 527, "Gainsborough," a horse of good stamp and manners, was highly commended. No. 505, "Hurricane," and No. 510, "Scotsman," are of the right sort, and go as if meaning business.

Class 40. *Hunter up to* 12 *stone.*—Here we had a large entry of twenty-eight, made up of a very useful lot, of which No. 554, "Cockney," was the best. He is a smart short-legged horse, and, unlike his namesake, went through the dirt as if he enjoyed it. He has plenty of substance on sound legs, and galloped like keeping on. No. 535, "His Majesty," was second. If his forehand had been as good as his hind-quarters, the chances are he would have held the same position as he did at the Alexandra Park, where he beat the Londoner, which, taking him all round, is the best formed one. No. 543, "Emperor," went strong and well, and looked all over a hunter; whilst No. 540, "Ferryman," the reserve number, was not far behind him, being a wear-and-tear looking animal, and fit to go in any country. No. 533, "Shaun Rhue," was commended. The Major did his best to ride him into a better place, but his action being rather too high for the field, it was no go.

Class 41. *Four-Years-old Hunter.*—The first on the list, No. 557, "Yeoman," kept his place; a blood-like chestnut and beautiful mover, but not much in hand over 12 stone. There was nothing, however, in the class that went like him, or looked so much like a gentleman, so he made an easy win. No. 573, "Katerfelto," knew how to go, but did not carry himself as though he could hold his own over Exmoor with his namesake; nevertheless, he managed to gallop himself into the second place. No. 567, "Golden Plover," got the yellow ribbon. He is a fine-topped horse, and if his joints and fore-legs had been better, would have been more forward; whilst he seems to gallop strong, he makes too much fuss about it, and does not get on. No. 571, "Fox Cover," the reserve, out of old "Go-a-head," without being a fast one, will make a good hunter some of these days. No. 575, "Gendarme," by "Flash-in-the-Pan," is a fine colt, and shows a deal of hunting form; but somehow or other the ring did not suit him, and he did not get away as he should have done. As

he is only a baby and all abroad, time may improve him and turn him into his right place.

Class 42. *Hunter Mare, Four-Years-old.*—The mares did not show in force. The class was altogether a weak one, with little or no merit, except Nos. 578 and 577, "Princess" and "Nancy Lee," "Princess" having the best shoulders and looking most like a lady. The numbers in the Catalogue were reversed. None of the others had sufficient merit for a place, and the third prize was withheld.

Class 43. *Three-Years-old Hunter.*—Not quite up to the mark. The winner, No. 591, "Prime Minister," a fine tall horse, with no end of quality and good true action, may some day grow down to his legs and make a hunter; if he does, he will carry a lot of money but not much weight, unless he thickens more than one would give him credit for. No. 586, "The Mystery," is a useful colt, with shoulders a trifle short. No. 590, "Woodman," a thickset customer, which moves fairly well without giving much promise of speed, was third. The reserve, No. 584, might in time fall into a hunter.

Class 44. *Hunter Mare, Three-Years-old.*—Only two entries. No. 594, "Princess Margaret," walked away from the other and won easily. She is by "Egbert," out of old "Sloughby," with good clean limbs and nice quality, though rather low in the back. She will some day hold her own over a country with a light weight on her back.

H. A. F. Luttrell.
John B. Booth.
John Hill.

Hackneys, Ponies, and Coach Horses.

The fifteen classes brought before us contained 206 entries; and some of them, especially amongst the hackneys, were animals of great merit.

We commenced our duties with—

Class 14. *Stallions suitable for getting Coach Horses.*—Our first prize, No. 208, is a level horse with true coaching action and full of quality, a point in which our second prize, No. 206, is somewhat wanting, though he moves grandly and is of a rich colour. The third prize, No. 222, is a very promising young horse, of the same character as the first prize, showing plenty of bone and quality.

Class 15—*Stallions for getting Hackneys*—was a strong class, numbering twenty-four. The first prize, No. 249, is a beautiful model of a hackney, and good in all his paces. The second prize, No. 247, moves well. No. 237 is a useful horse, but a little inclined to have harness shoulders. We highly commended two in this class and commended other two.

Class 16. *Pony Stallions above* 13·2.—Here again we felt a doubt about giving No. 261 the first place. He is a compact horse, with rare action and beautiful shoulders. No. 255, the second prize, is also a fine mover; better in this respect than No. 259, in the third place.

Class 17—*Pony Stallions not exceeding* 13·2—brought in fifteen for adjudication. Nos. 264 and 266 were soon drawn out. No. 266 is a little castle in strength; but his shoulders did not quite please us, and we preferred the greater quality shown by his rival, No. 264, to whom we awarded the red rosette. For the third place we selected the well-matured brown two-year-old, No. 263.

Class 31—*Coaching Mare and Foal*—only brought three entries. The first and second prizes are very handsome mares, with true coaching character and of the old Cleveland type.

Class 32. *Hackney Mare and Foal.* Not numerously attended. The first prize, No. 451, is a pretty blood mare, but, we may say of the class generally —that it had hardly sufficient substance for breeding valuable hackneys.

Class 33. *Pony Mare and Foal.*—Here we had some creditable ponies, but of a mixed character. Our first and second prizes show great blood, whilst the third goes to a handsome thick cob.

Class 45—*Coaching Mare or Gelding, Three Years old*—was represented by only one entry, but a horse of considerable merit of the Cleveland bay type, and well worthy of a first prize.

Class 46. *Coaching Mare or Gelding for Omnibus work.*—Here we had two animals of a high class, Nos. 603 and 604; but we did not consider them eligible to compete as "Omnibus horses," and we gave the prize to No. 602, a strong useful gelding.

Class 47. *Hackneys up to* 15 *stone.*—A fairly good class. No. 614 is a beautiful hackney in all his paces, and an easy winner.

Class 48—*Hackneys up to not less than* 12 *stone*—brought twenty-three competitors, and contained animals of a very high class. We placed No. 633 first, a fashionable mover, but perhaps with action rather too round and roadster-like for a hackney. No. 625, a perfectly trained gentleman, came second, and No. 641 third. We highly commended two, and gave five commendations.

Class 49—*Ladies' Hackneys*—was not a good class.

Class 50—*Hackneys above* 13·2, *not exceeding* 14·2—paraded twenty-five. No. 656 soon came to the front, a mare of a high class. The second prize, No. 673, is also a very fine mover.

Class 51. *Ponies above* 12·2, *not exceeding* 13·2.—Here twenty-one put in an appearance. No. 686 was an easy winner, though too fresh to show herself to the best advantage.

Class 52. *Ponies not exceeding* 12·2 was a very good class. Both our first and second, Nos. 704 and 703, are remarkably smart well-made ponies, and a nice pony is third, No. 705. We also highly commended four and commended one.

Alfred Ashworth.
Wm. Parker.
Henry Beevor.

Foreign Horses.

Fifty-nine entries from abroad, and a not inconsiderable reduction in the number of foreign animals brought into the ring, hardly sufficed to give to the Kilburn Show that international character which the increased facilities for transporting horses across the Channel led every one to hope that it would assume. The prizes offered were, moreover, worthy of a larger competition, and the absence of French horses was noticed with regret by those who well know how many of our neighbours across the Channel are in a condition to follow the spirited example set them by M. Edmond De La Ville, by whom twenty-eight entries were made. Before noticing the foreign classes more in detail, I claim permission to remark that Belgium sent one animal to Kilburn, in M. Paul Tiberghien's flea-bitten grey cart-mare "Sultana," which was undoubtedly a

great acquisition. "Sultana" delighted the spectators day after day by trotting at a speed which must sorely have tried the lungs of the nimble groom who led her, and with a lightness and activity which recalled the performances in former days of Mr. Brierley's famous prize-winner "Sensation," from Wolverhampton—a magnificent grey cart-mare, which, measuring nearly 17 hands under the standard, trotted with the neatness and agility of a pony.

Percheron, Boulonnais, and Belgian Stallions.—Percherons, once well known upon every "route impériale," or "route nationale," in France—the name having changed time and again with the form of government—have the reputation of being the best and lightest trotters among cart-horses; and it is probable that many of the heavy grey horses in our omnibuses are got by imported Percheron stallions out of English mares. The posters of France in former times were almost exclusively of this breed; and the omnibus horses in Paris, which at present drag the ponderous vehicles circulating in every part of the French metropolis at a speed altogether too slow to suit our insular impatience, come from the same race. The heavy cavalry horses of Kellermann and of Milhaud, which trotted round the squares of the indomitable British infantry at Waterloo, had plenty of Percheron blood in their veins, and showed themselves, moreover, far too massive for the light regiments under Lord Uxbridge at Quatre Bras. The Percheron, and his congener, the Boulonnais, have long been favourites in this country, although our national partiality for a race which cannot bear comparison with our own best cart-horse tribes is hard to explain, unless it be that, in the minds of all English travellers who have passed middle age, their earliest recollections of France are inseparably associated with the screaming and unruly grey or white stallions which lugged the *malle-poste* up the steeps of the Jura Mountains, or along the poplar-skirted *pavés* of Limousin and Picardy. It is denied by the best equine authorities of France that the Percheron is a distinct breed, and M. Devaux-Loresin asserts that the decree of the First Napoleon, in 1806, establishing a stallion stud at Blois for the creation of artillery and cavalry horses, called the Percheron into existence, with his neat head, nimble knee-action, and singular propensity of being what in Yorkshire is called "handy with his teeth," or given to biting. The specimens shown at Kilburn were few in number, but among them the first and second prize-winners, belonging to M. Modesse-Berquet and to the Duke of Westminster, were not without considerable merit; although for agricultural purposes they are hardly equal to their Belgian rivals, which,

again, lack the fine length and gentlemanlike qualities of the Clydesdale. M. Paul Tiberghien, of Hainault, in Belgium—almost the only exhibitor from that country—is specially to be congratulated upon his excellent, but rather short, roan stallion "Bayard II.," and still more upon his superb mare "Sultana," whose praises have already been celebrated in this Report. If, as is generally believed, our own cart-horse tribes derive their origin from Flemish and Belgian ancestors, it will be confessed that we have gone so far ahead of the parent stock as to be in a condition curiously to scrutinise M. Paul Tiberghien's animals, since they suggest the original and not much altered materials from which our Suffolks, Clydesdales, and English cart-horses have by gradual evolution been matured.

Norman and Anglo-Norman Stallions.—M. Edmond De La Ville had this class almost to himself; and although some of his exhibits were singularly plain about the head, and faulty in the cannon bones, I have seldom seen sixteen animals of the coaching type more uniform in character. Normandy has the distinction of being the most ancient horse-breeding district in France, and its proximity to England enabled the Norman farmers long ago to import good stallions from this country, which have gradually so improved the equine race in those parts, that M. Edmond De La Ville may now claim to meet our coaching and roadster classes upon terms of equality, if not something more. It is alleged by the French Judges that the best animal entered for this class was taken ill and unable to appear in the show-ring; but many of the specimens exhibited were admirably adapted to get coach and omnibus horses for English use, and occasionally a superior excellence of knee-action promised well for the production of roadsters, as in the case of the shapely three-year-old stallion "Ukase." It is, indeed, impossible to contemplate this class without reflecting upon the obligations due from Normandy to the late French Emperor, who was never weary of encouraging the residents in the Eure, in Calvados, and in the adjoining Departments, to make the most of their advantages in soil and climate, so as to produce troop-horses for the French army. The prices paid for cavalry horses by the French Government have always been in excess of those allowed in this country; and if, as is promised in the last reports, this tariff is to be lowered, it will be mainly through the enterprise and sagacity of such breeders as M. Edmond De La Ville, who might well have left some of his Anglo-Norman stallions behind him in England, without disadvantage to those of our farmers who desire a substitute for the expiring Cleveland breed.

It is worthy of remark, in conclusion, that the Central Agricultural Society of Littauen in East Prussia made eight entries —all of them being mares—at Kilburn. There were some absentees, but among the animals exhibited there were not, in all the horse-classes assembled upon the ground, many more worthy of critical examination than the brown five-year-old mare "Frieda," to which the first prize was given, and the bay-brown four-year-old "Liese," which was highly commended. The stud of East Prussia, with the Crown Prince of Germany for its President, is represented by about 30,000 brood-mares, distributed over a large lot of farms. "The breeding," it is stated, "takes place according to the principle of freedom from hereditary faults, and of correctness in form." Many of the best cavalry horses employed by the Prussian army in its successful campaigns of 1866 and 1870–71, came from this stud, to which "Frieda," "Liese," and "Gudrun" did great credit. The whole affair seems to be admirably managed; and if any fault was to be found with the lengthy, level, and powerful mares "adapted for riding purposes," and shown at Kilburn, I should be inclined to say that they are better adapted, with one exception, for harness than for the saddle.

The following is the Report of the Judges of Foreign Horses:—

Class 240.—Amongst the twenty Norman and Anglo-Norman stallions were some very well made, with good paces and distinguished carriage, good legs, and much elasticity of movement. However, more than one had a very ordinary head, and ribs not well sprung (*réserver*), and several showed cannon-bones and fetlocks which were not satisfactory. Unfortunately, one of the most remarkable horses (No. 2696), and one which will do honour to his breeder, became ill, and was therefore out of the competition. He was a dark chestnut horse, and not bay, as stated in the Catalogue, and would have well merited one of the first prizes. The fine shoulders, excellent ribs and superior action of No. 2702 gained him the first prize, while the second was taken by No. 2699, which had good form and colour. The third prize went to No. 2703, a magnificent coach-horse. No. 2707, awarded the reserve number, deserves to be mentioned as a remarkable horse, exceedingly level, having short legs, and endowed with distinguished action. No. 2697, which was highly commended, is a fine horse, but has hollow insteps, and appears also much too tall for his age. No. 2711 is a good horse, but of only middling size.

Class 241.—This class contained only one mare, but she was one of the finest in Normandy—a chestnut with plenty of blood and very clever (*beaucoup de moyens*); marvellously formed legs and beautiful sinews. Her foal by "Lavater" is a fine animal, very active and very strong.

Class 246.—With the exception of the Arab (No. 2729)—of distinguished blood certainly, but not fit for stud-purposes, having especially the cannon-bones excessively long,—the horses in this class recalled to us the type of Class 240, which are all Norman horses. No. 2733 arrested our

attention first, and he was without doubt a clear first. He is a very fine animal, with high action and very vigorous. Nos. 2739 and 2732, to which the second and third prizes were awarded, as well as No. 2735, given the reserve ticket, and No. 2738 commended, are all good horses, elegant trotters, at a good pace (*envolure*).

Class 247.—The Arab mare, No. 2751, a chestnut, is well made, but too delicate to take the prizes from the others in this class. These were eight mares, light bay in colour, and of the distinct type of the horses of Eastern Prussia, which have a great deal of blood in them, both Arab and English. They have a fine form, beautiful hind-quarters, high action, and great agility. The legs and the sinews are perfectly firm (*secs*). No. 2746, with thin ribs and long fetlocks, and No. 2748, with hollow insteps, should not have been allowed to be exhibited by a Society which sent such remarkably good horses as Nos. 2742, 2749, and 2741, which carried off the three first prizes, as well as No. 2744 (reserve number), and No. 2750, which was highly commended.

(Signed) Comte de Schlieffen.
Comte de Bouillé.
A. Ronna.

Mules and Asses.

It is but too probable that the readers of this Report may be prompted to exclaim, in the words quoted by Mr. Gladstone at the end of one of his longest Budget speeches—

> "Immensum spatiis confecimus æquor,
> Et jam tempus equûm fumantia solvere colla."

Long, however, as has been my disquisition upon horseflesh, it would not be difficult to write as much again upon the theme of the half-dozen little-noticed and uninviting animals contributed by Mr. Charles Leslie Sutherland, by the Duke of Beaufort, and by Mr. Edward Pease—all of them enthusiastic believers in mules—to the last four classes in the Catalogue. The presence of these ungainly quadrupeds at Kilburn was made known to the ear rather than to the eye; nor were they ever brought before the public without provoking a roar of laughter from the spectators who had greeted with hearty applause the successful saltatory exhibition of Mr. Andrew Brown's "Gambler," when, despite his rider's efforts to stop him, the irrepressible chesnut gelding jumped the rails which ran across the centre of the ring.

Nevertheless there were present at Kilburn some eye-witnesses who had seen not a little of the prodigious Civil War which raged in the United States between 1861 and 1865, and to them Mr. Sutherland's mules appeared to be rather objects of admiration than of ridicule. The mule has, up to the present time, made little way in the affections of Englishmen; and among the

few who have tried him for agricultural purposes, without understanding his peculiar habits or studying his character, there is too much disposition to pronounce him a stubborn, unintelligent, and impracticable brute, which eats as much as his nobler half-brother, and does not get through half as much work. A time, however, will come—and the sooner the better—when Englishmen will be compelled to acknowledge that, for certain military uses, the mule is the most valuable four-footed servitor upon which man can lay his hand. And I may notice parenthetically that unfeigned astonishment is often expressed by American soldiers of experience and intelligence that the British War Office has been so long in discovering that the little wars, in which this country is perpetually engaged, would be conducted with greater promptitude, and at far less cost, if a large mule-train were always kept in readiness at home. It will be urged, perhaps, that mules in any quantities can always be purchased in the United States, in South America, or in Spain and Malta; but precious time is needlessly lost when scanty preparations for war are made until it has actually begun; and, in addition, the outlay, by reason of a sudden demand, is vastly increased, to the disadvantage of the purchaser. Moreover, it is indispensable that teamsters, trained and accustomed, in the slang phrase of California, "to exhort the impenitent mule," should be equally available with the drudges they are expected to drive; and experience has taught us in Zululand, that the American teamster, whether white or black, is for the most part as larcenous and unsatisfactory a blackguard as ever crossed the Atlantic. What we want is, beyond question, soldier-drivers, trained at Woolwich and elsewhere to know and handle the mule; which, rightly comprehended, is a remarkably docile and intelligent quadruped, and one to which his habitual employers soon become accustomed and attached.

It must not, however, be forgotten that, except for supply-trains and commissariat-waggons, the mule is not available for military purposes. He is altogether unfit to be "hitched" to field artillery, because guns of this kind, especially when going into action, are apt to get into all sorts of queer places, and to be lugged up steep and difficult banks, or across boggy holes and quagmires. If once a mule-team gets "stalled," or, as we say in England, "bogged," the animals become demoralised, and refuse, unlike the generous horse, to make another effort. It will be obvious that under these circumstances a field-gun, stuck tight within range of the enemy, and with no chance to unlimber and open fire on its own account, is worse than useless. When, however, we come to the multitudinous waggons

which are necessary to supply food, forage, medical stores, boots, blankets, clothing, great-coats—to say nothing of ammunition, cartridges, and a thousand other essentials—upon a large scale, it will soon be found that the tough and hardy mule is immeasurably superior to the more delicate and sensitive horse. The mule will thrive and grow fat upon food which the horse will not touch; and while the thin skin of the nobler beast is perpetually liable to be galled and subject to sore backs, the mule is practically as pachydermatous as the rhinoceros, and needs nothing but a good roll—if possible in the sand—to stand him in the stead of rubbing and grooming. He is not less indifferent to heat or cold, to rain or shine, than Sir Walter Scott's William of Deloraine was to "moonless midnight or matin's prime;" and he begins work at two years old, frequently sustaining it unintermittingly, and without a day's interruption from sickness or lameness, until he is six or eight and twenty years old. Finally, when it comes (as it always does in a prolonged war) to a question of killing horses or mules, in the absence of other food, for the support of human life, no one of the least experience in such matters will hesitate to give the preference to mule's flesh. There is a cut from the mule's jowl which is pronounced by Jules Gouffé to be unsurpassed in flavour; and it is notorious that, during the siege of Paris, a *selle d'âne* was sold inside the beleaguered city for what Louis Blanc calls "a king's ransom." I have said enough to show that the neglect of mules by Englishmen, and especially by our torpid and unprogressive War Office, is one of those national blunders which, in Talleyrand's well-known phrase, is worse than a crime. The day, however, I trust, is at hand when the last classes in the Prize-sheets of horse-shows prepared by the Royal and other English Agricultural Societies will be filled, not by a dozen exhibits, with a couple of 20*l.* first prizes to sustain them, but by a *concours* of scores upon scores of hybrids, ranging between sixteen and seventeen hands in height; with 50*l.* prizes offered for their sires; and finally, with experienced judges from Kentucky and California to pronounce that neither of those opulent and advancing States can boast more magnificent specimens of the mule than these islands are producing.

Report of the Judges of Mules.

Class 53. *For Agricultural and Heavy Draught Mules.*—By the conditions all animals were above 15 hands. The winner of the first prize was a powerful grey of great beauty, 9 years old, and showing marks of constant hard work. The build combined the qualities of strength and activity in a

singular degree—powerful loins, deep ribs, fair crest, big hocks and knees, and absence of lumber. Strength was manifest in every part of it, and there was no falling off anywhere. The second prize was awarded to "Blossom," another powerful animal of the Poitou breed, 11 years old, worthy of all praise, but not so compact as the former. This mule had evidently been worked hard, and had not been prepared for exhibition. The third prize went to "Brunette," also a Poitou mule of much the same character; points falling off a little; but all three animals, which were sent by the same gentleman, C. L. Sutherland, Esq., were grand, and it was no disgrace to the Duke of Beaufort, Lord Arthur Cecil, Mr. Hodsoll, Mr. Pease, and others, to have failed in comparison. It suggested itself to me that the build of these animals peculiarly adapted them for heavy traction purposes—say for artillery. No. 726 was highly commended and placed as the reserved number.

Class 54. *Mules, not exceeding* 15 *hands, for General Purposes.*—The first prize was given to an eight-year-old piebald, bred in Kentucky, the property of Mr. Sutherland. The character of all in this class was to be lighter than in Class 53, as well as not to be so high. They looked more active, and the first prize had a remarkably thoroughbred appearance and carriage, suggestive of good blood on the dam's side, and fitness for fast hack and harness purposes. He had evidently been actively employed, and though somewhat slight, he was well-knit, and had a hardy, wire and whalebone look about him that clearly pointed to pace as well as to endurance. The second prize was given to a brown four-year-old, bred by Sir George Elliot, M.P., from a Welsh mare pony by an Egyptian sire. The third prize was obtained by a mule shown by the Duke of Beaufort; age and pedigree unknown. It had good general quality, as also had mules shown by the Aylesbury Dairy Company, and Sir George Elliot. The animals in this class fully carried out the conditions of "usefulness," and gave the impression of being most valuable for speed and endurance in light vehicles; but their build might not so well fit them for carrying. No less than eight in this class obtained the favourable notice of the Judges.

The general considerations of comparative usefulness suggested by this exhibition are that mules as a whole are much better adapted for draught than for carrying purposes; and, looking to the peculiar features of the animals used for breeding, that the Poitou donkey, as a sire, is loose in loin, long in pastern, and slack in other points, a little strength being sacrificed to obtain *size*, which the Poitou and no other donkey gives. For general purposes I cannot help thinking that the Syrian ass, as a sire, should give the best quality, as having a better back, better legs and feet, less lumber, and a cleaner and smarter appearance. Spaniards use this smaller-sized light mule in teams for diligences, and where swift traction is required. The Americans use the powerful or light mule extensively for the particular work they require, and they value the creature exceedingly, as standing neglect better than the horse, while he is available for a greater number of years, and is less liable to sickness and deterioration. Mules have doubtless fits of obstinacy, but they have a well-established character for steady work, at which they do not chafe and fret. They would seem to be peculiar in the fact that they will not thrive on wet grass, notably Gapo grass; while they get on well with dry food. The main advantage of mules would seem to be a capability for far more years of steady hard work than a horse could possibly go through, and in all probability doing with less food, but most assuredly with a greater immunity from maladies. I got many of these facts from personal observation in Mexico and the Brazils, where mules are almost exclusively employed both for traction and for carrying purposes; and the Mexicans and Brazilians find their account in using mustangs as dams; but my experience, it is only fair to say,

is not of a very recent date, so far as Brazilian matters are concerned. It is manifest—at least it is my strong opinion—that mules of any character, and for almost any purpose, can be produced by a proper selection of quality in sire and dam respectively. When size and strength are wanted, the sire would naturally be the largest and most powerful ass procurable, the blood and breed depending on the mare; the smaller active mules, or ginettes, being got by pony sires from female donkeys. A vast number of facts are on record with respect to this species of natural selection, which, if the breeding of mules comes into favour, could all be collected and utilised in the scientific breeding of an animal which experience has taught me to look upon as most valuable, as doing pretty nearly all that a horse could accomplish, and having qualities of endurance which are superior by far; and I feel very sure a mule could be bred with almost all combinations of size, power, fleetness, and symmetry.

William Lort, F.R.G.S., &c.

XXIII.—*Report on the British and Foreign Cattle exhibited at Kilburn.* By Thomas Bowstead, Edenhall, Cumberland.

Long before these pages meet the eye of the reader, all those who take an interest in agricultural matters generally, and in the vast and important work of the Royal Agricultural Society of England in particular, will have learnt through divers channels that the recent Exhibition at Kilburn, near London, was beyond question the most extensive, the most varied, and the most important display, as well of live-stock as of farm-implements, that has ever been held in any country. The statistics already given by the Senior Steward of Live-Stock (p. 555) show that the only exhibition at all approaching Kilburn in cattle-entries was that held at Battersea, in 1862. And with the increase in numbers at Kilburn (1007, against 789 at Battersea) there was also observable, after the seventeen years' interval, a most marked improvement in the quality of the cattle-classes. True it is that Great Britain has long maintained a proud pre-eminence in the breeding and management of every description of domestic stock. Her race-horses and hunters have stood unrivalled; her stupendous dray-horses, her nimble and corky roadsters, have been the wonder of foreigners; her sheep are remarkable for their variety, their early maturity, and their economical development, alike of wool and of mutton; her pigs contrast favourably with the rough coarse swine of many other countries; while her roast-beef—whether cut from the Shorthorn, the Hereford, the Devon, the Sussex, the Norfolk and Suffolk Polled, or from any of the famous Scotch breeds—

has long been proverbial for its flavour, its fineness of grain, and its juicy richness. All these excellent qualities were most amply illustrated and successfully maintained at Kilburn, and any one doubting the fact had only to turn from the Foreign to the English cattle department. Never before was there drawn to one spot such a magnificent display of British animals of the farm.

Over-feeding (by which is meant that laying on of fat to such an extreme as must either destroy altogether the powers of breeding, or must render the produce not only few and far between, but also small and unhealthy), though not in excess of former years, was nevertheless far too prevalent at Kilburn, both amongst the Shorthorn, Hereford, Devon, and other principal breeds. Not a few exhibitors of sheep were in sad dismay when it became known, on the opening day, that a large number of entries had, and very properly too, been disqualified on account of unfair shearing and trimming. They were debarred from competition because, instead of being clothed in a fleece of three months' growth, they were found to be enveloped, disguised, disfigured in a covering partly of two years' production! And is it not equally unfair and unjust towards the few high-minded exhibitors, whose cattle are brought to the Show in a reasonable state of fatness, to stand by, time after time, season after season, and see their animals unfairly beaten by others whose natural form and framework are entirely hidden from the Judges by a superabundant, oleaginous, and often unsightly covering, which, started at calfdom, has cost the owner much anxious care and expense to bring to the requisite Showyard thickness? Even if this frequent and highly objectionable obesity had no other effect than to divert the prize-tickets from the right to the wrong animals, it would be bad enough; but it has an effect far more baneful than that; for, in nine cases out of ten, no less in males than in females, it entirely destroys their fecundity, while in the case of females, if they breed at all, they almost invariably fail to produce enough milk for their newly born offspring. To many a well-known and successful breeder, met with at Kilburn, I put the question, "Have you any of your cattle here?" and the immediate answer was "No." I naturally, in some instances, inquired "Why?" when I was told, "Because, if you mean to win nowadays, not only at the 'Royal,' but even at your own little county-show, you must make up your mind to feed from infancy, and my beasts are too valuable, and have cost me too much to breed, to allow of my making any such silly sacrifice." Evidence such as this, coming from authorities of the highest

and best rank, naturally makes one ponder and say, "But surely there must be a remedy for this, or a means, at least, of diminishing an evil which is on all hands admitted and known to exist." That there are difficulties in the way, as there always are in carrying out reform, will be freely admitted; but the Council of the Royal Agricultural Society is not composed of men accustomed to shirk duty when a crying, and a universally acknowledged, evil needs to be dealt with. Let us hope, then, that members of Council will, in their wisdom, give the matter their careful consideration; and if they can abate, or even mitigate, this system of gross-feeding for show, they will receive, as they will deserve, the everlasting gratitude, not only of stock-exhibitors, but of all right-thinking men. One word more on this subject and I shall have done. I noticed with much satisfaction that at Birmingham, in 1876, where, oddly enough, there were the self-same Judges of Shorthorns as at Kilburn (thus showing that there are few indeed who come up to the requisite standard of fitness), Messrs. Drewry, Mitchell, and Chaloner did themselves infinite credit by refusing to place a heifer, "one of the best in her class," because she was "very much injured by over-feeding." This highly praiseworthy and straightforward line of action the same gentlemen might well have followed up at Kilburn, though the fault of too gross feeding was by no means confined to Shorthorns. But a matter so important, not to say invidious, ought not to be left to the Judges. A small Committee of practical men (drawn, if you will, from the Council), who would do their duty without fear, favour, or affection, should examine the classes before the Judges commence their work, and should strike out all entries showing undoubted signs of "injury from overfeeding." Once start the plan, and cases of objection will soon be exceedingly rare.

One other difficulty which besets the would-be exhibitor at our national or far-off Shows is the enormous rates charged by railway companies. If, as is very frequently the case, the distance to be travelled is considerable, transit by an ordinary goods-train is too slow and too jolting, alike for the comfort as for the safety of the animal. In such cases the only alternative is the horse-box, about the most unsuitable vehicle for a bull or a cow that could possibly be constructed. And then, what are the rates? A calf, no matter how young, and occupying only one division of a horse-box, is charged as for a horse and a half! A larger beast, occupying, as it must do, at least two divisions, is charged the same as three horses! while a full-grown bull, or in-calf cow, or other beast, requiring the exclusive use of a horse-box, is charged as four horses! The

rate charged by the several railway companies to whom I applied for information is 3*d.* per mile for each division, or each horse; hence, the cow occupying one compartment pays 4½*d.* per mile; the next, using two divisions, 9*d.*; and the costly brute requiring an entire box, 1*s.* per mile! I have been induced to touch upon this subject of railway-charges through hearing that a North-country friend, an extensive breeder of Shorthorns, had been charged the enormous sum of 13*l.* 3*s.* 4*d.* for carriage of a heifer-calf from Wateringbury, in Kent, to a station a few miles west of Carlisle, being at the rate of about 9*d.* per mile, while the owner himself could have done the journey, and very comfortably too, at a penny per mile!*

Having made these somewhat tedious, though, as they appeared, necessary digressions, I will now turn to an examination of the Cattle Classes, beginning with

Shorthorns.

I have felt that the following remarks on this department of the Show may not unfittingly be prefaced by a short but well and kindly meant allusion to one who helped on, perhaps more than any man now living, the profitable breeding of high-class, beef-growing Shorthorns, and whose sudden and early death, in December last, sent a pang of true sympathetic sorrow to the hearts of his many admirers, not only in this country, but far beyond the shores of the British nation. Indeed, wherever Shorthorn-cattle have been introduced, the name of "Tom Booth" (if I may be pardoned the familiarity) had long been received with a degree of admiration bordering on devotion, and therefore very many dwellers in far-distant lands shared with Englishmen deep and sincere regret at the loss of a much-valued friend. I never before attended a Royal Show where Mr. T. C. Booth was not conspicuous by the side of the Shorthorn ring, his large experience and keen judgment often enabling him to "spot" the winners before the Judges-proper had

* The reporter has drawn attention to a continual source of complaint from exhibitors, and the Council have made several efforts to modify the charges specified. The utmost that they have been able to effect is to preserve for the exhibitors the choice of using horse-boxes for Show animals even at these rates. But for the action of the Council, a regulation which had already been issued by the chief railway companies, prohibiting the use of horse-boxes for the conveyance of cattle, would have been enforced about two years ago. The high charges mentioned are levied in consequence of the necessity of disinfecting the horse-boxes after each journey, and as a payment for the consequent rotting of the padding with which the horse-boxes are lined.—Ed.

examined half-a-dozen of the class. At Kilburn, alas! the devoted husband, the loving father, the genial friend, the warm-hearted neighbour, the safe adviser, was not! And many a one at the ring side was heard to exclaim, "How one misses poor Booth!" In him it may well be said the Royal Society lost one of its wisest councillors, and agricultural progress a most zealous, untiring, and able advocate. May his sons take example from a noble-minded father, a true patriot, an honest man!

Class 57. *Bulls over Three-years-old.*—Of the eighteen entries in this class, the goodly number of 16 came before the Judges, and the frequent expression of competent onlookers was that they were "a grand lot." Several of the older animals have been winners at the Royal and other leading Shows more often than can be here enumerated, and it was open to question whether their owners acted wisely in still subjecting them to the fatigue which is inseparable from Showyard life. And here it may be suggested as worthy of consideration by the Council whether, instead of encouraging matured male animals to compete again and again in the ordinary class, they might not, somewhat after the Scotch fashion, offer a champion-prize, to be competed for only by previous winners in the leading class of bulls.

Notably among the "old" bulls at Kilburn was Mr. John Outhwaite's "Royal Windsor" (29,890), who, at ten years and five months old, astonished everybody by his freshness; and it was not until a long debate amongst the Judges that he was placed so low as fourth.

The first prize went to Lord Rathdonnell's "Anchor," (32,947), an Irish bull, bred by Mr. Chaloner, who was one of the Judges, and who on this account very wisely and with good grace declined to interfere in the class until his colleagues had disposed of "Anchor" by awarding him chief honours. This bull, unlike too many in the class, had the great additional recommendation of being exhibited in moderate working condition. He has a fine masculine head, well-formed substantial horn, prominent eye, deep and very wide breast, mellow touch, hide a trifle thin, shoulder-points neat, chine somewhat narrow, plates bare, flanks deep, hind-quarters very good, and thighs nicely covered with flesh, even to the hock-joints. Some might think him just the least bit "on-leg," but in this respect he improved on acquaintance, and his uniform neatness and evenness, and lightness of offal, stamped him as a grand Shorthorn. The Judges say in their Report that one of their number (and there were then only two acting) would have placed

"Attractive Lord" (32,968), appropriately so named, first; but, as no third-man was called in, it may be presumed that this objection was withdrawn. This decision was not unanimously accepted by the public, many of the bystanders preferring Lord Ellesmere's bull, who was first at Bristol last year, and was shown here in the very pink of condition, if, indeed, he was not *too* fat. He is of a deep rich red, is full of freshness and vigour, and is altogether a taking bull. His depth in front is a perfect marvel, while his majestic carriage of a perfect head and noble crest will always keep him in the foremost rank. Though deposed, in a measure, from last year, to take third honours here was no despisable rank. The second prize was awarded to Mr. T. Willis's "Rear-Admiral" (37,310), bred by the exhibitor. His own brother took leading honours in the next class, doing all the more credit to the enterprising owner. "Rear-Admiral's" ribs form that perfect cylinder which every Shorthorn fancier loves to see. His loins are good, and his hind-quarters remarkably long and well covered; his bone is fine, thighs and twist are excellent, while behind the shoulders, where so many Shorthorns fail, he measured more than at any other part. His head is short and broad, while his plates are a trifle bare, and, when viewed from behind, he looked somewhat narrow. Next to the four prize-bulls, I liked "Duke of Chamburgh" (36,052), bred by Mr. Outhwaite, but exhibited by Mr. W. A. Mitchell, of Whitehouse, Aberdeenshire. Got by the far-famed "Royal Windsor," and out of "White Socks" by "Baron Killerby," he is indeed a worthy son of most worthy parentage. Mr. Alexander H. Browne, of Chathill, Northumberland, showed two very stylish bulls in this class, both of them calculated to leave their mark amongst average Shorthorn cows.

Class 58. *Two-year-old Bulls* were, barring the prize-animals, considered by the Judges to be inferior to the older class. The red ribbon, as has already been stated, went to Mr. Willis's "Vice Admiral" (39,257), who has now scored three Royal firsts in three successive years! This bull, though somewhat spoiled by his short, ugly, turned-back horns, and want of hair, displayed a grand twist, and large rounds, capitally sprung ribs, and powerful, well-fleshed loins, with perfect hind-quarters. Colonel Kingscote's "Cowslip Boy" (38,051), the second prize, displayed a wonderful covering of rich hair, neat shoulders, big rounds, and flesh to the very hock; he had, moreover, deep flanks, but was a shade down in the loins. "Osman" (40,415), the third-prize bull, was not so good as "Duke of Hazlecote 48th" (39,742), the "reserve," which was bred by Colonel Kingscote. The former was somewhat flat in the ribs

and rough in the shoulder-points; while the latter was a neat bull, mellow in touch, and stood well on his legs. The fourth ticket went to Mr. Alexander H. Browne's "Patricio" (38,852), by "Pioneer" (35,042), the first-prize yearling at Taunton in 1875, and the winning two-year-old at the Birmingham Royal in 1876. Rich alike in colour and hair, he carried well-sprung ribs, but was somewhat weak in the loins.

CLASS 59.—*Yearling Bulls*—though containing some good animals, was, say the Judges, "not more than a fair average class," and was easily topped by Mr. Handley's "Master Harbinger" (40,324), a son of "Alfred the Great" (36,121), and winner of first honours this year at Doncaster in the yearling class, where he also carried off the champion cup for Shorthorns, beating Mr. Willis's "Vice-Admiral," already described. This highly promising young bull, resembling "Anchor" in many points, showed a broad and well-fleshed back, grand loins and crops, rich hair, and mellow touch, and capital fore-arm, with a slight want above the hocks and in the rounds. The Rev. R. B. Kennard's "Prince Regent," from "Queen Ann," and sired by "Grand Duke of Oxford" (28,763) (bred by Lord Braybroke), was a good second. He is a singularly rich roan, covered with a mass of grand hair, has a wonderful flank, and grand quarters. A slight improvement behind the shoulder would make this bull take a lot of beating. Third honours were awarded to Mr. William Linton's "Arthur Benedict," a worthy grandson of his far-famed Royal bull, "Sir Arthur Ingram" (32,490), showing rich hair, big loins, and long firm quarters, deep and prominent bosom, and beautiful head. He was, however, slightly abdominous, giving the ribs an appearance of flatness. Lord Arthur Cecil, of Orchardmains, Peeblesshire, easily secured fourth ticket, with his "Wild Oxonian" (40,927), a judicious purchase at the Shotley Hall sale, in 1878, and fourth-prize calf at Bristol last year. His somewhat crooked hind-legs, caused by overgrowth, and by having been put to service too soon, kept this otherwise valuable-looking stock bull from securing a higher position. The "reserve number," bred and exhibited by Mr. James Snarry, of Sledmere, near York, from "Wild Rose," a daughter of "Ignoramus" (28,887), bred by Mr. Lamb, near Penrith, and first-prize two-year-old at Cardiff in 1872, will grow into a massive and very useful sire. His slight defect behind the shoulder, which is even now counter-balanced by a beautiful coat and other meritorious points, will disappear with age. "Autumnus," too, in the adjoining stall, exhibited by Mr. Richard Stratton, had, in addition to his large thighs and quarters, deep fore-end, and famous neck-vein, many

excellent Shorthorn characteristics; while the well-ribbed, fine-boned, short-legged, long-quartered "Suleiman Pasha," bred and exhibited by His Grace the Duke of Northumberland, had a host of admirers, and will be heard of again. He was ticketed for sale, and looked all over a good seller.

Class 60. *The Bull-calf Class* at the Royal is always an interesting and generally a good one. It has, however, often been larger and more uniformly excellent than at Kilburn: still there were some highly promising youngsters, boasting the best blood of the day. The winner, exhibited by Mr. Joseph Stratton, of Alton Priors, was fortunate in beating the third prize. He has, it is true, a broad back, deep flanks, rich quality, abundant hair, grand bosom and twist, but he lacks the style of the Shotley bull-calf, which I reckoned the best in the class; his one slight fault being the tiniest defect behind the elbow. Mr. Jabez Cruse, from North Devon, showed two useful calves, one of which, having a remarkably long name (the Shorthorn Society—indeed all compilers of herd-books—should limit names to three words at most), and highly commended at Exeter, took second prize, and was sold at a good price to go abroad. No. 815, also owned by Mr. Cruse, was slightly out of health, and lost a place in consequence. This pair were got by "Oxford Duke 10th" (38,830)—the winner, I was told, of 16 prizes out of 19 competed for. The fourth prize was gained by Mr. Mumford, from Oxfordshire, with "Country Boy," a dark red, full of soft hair, but crooked behind. The "reserve," out of a "Darlington" cow, and sired by Mr. Davies's "Grand Duke of Gloucester" (36,721), struck me as a well-haired and highly promising stirk.

Class 61. *Cows.*—This class, notwithstanding the accounts one reads to the contrary, must be pronounced first-rate, and I was not surprised to hear an experienced breeder and frequent exhibitor and winner at all leading Shows exclaim, "I've not seen as good a class of cows at the 'Royal' these twenty years." After this assurance, coming as it did from high authority, and seeing that of the twenty animals exhibited no fewer than ten got prizes or commendations, what shall be said of the fortunate dame which outstripped the lot? I am aware that the decision was not universally approved (few decisions are); we have it in the Judges' own Report that one of their number would have placed Lord Exeter's cow first. This, again, would not have satisfied those, and there were many, who preferred Mr. Bult's white cow. But to return for a moment to the first-prize cow, "Grateful," bred and exhibited by Mr. T. H. Hutchinson, and the heroine of many a Show-ring both before and since.

Kilburn. She may be briefly described as possessing truly cylindrical ribs; shoulders neat, sloping, and well covered; bosom, foreflank, and entire underline remarkably good; twist perfect, bone light, head sweet, and neck-vein full; rather wanting in hair, colour slightly delicate-looking, and growing a trifle patchy behind. "Grateful" has the distinguished honour of being the dam of the winning yearling heifer, and champion female at Kilburn, thus proving that, besides being herself a cow of rare excellence, she has produce which surpasses even herself in Showyard success. "Telemacina," already mentioned as taking second honours, had a well-rounded barrel, and great length of quarters, but she drooped a trifle behind, and was more patchy in the rumps than her vanquisher. Still she is a fine massive cow, and has taken many a first ticket in no mean company. Mr. J. S. Bult's white cow "Annette," which took third place, was the essence of neatness, symmetry, and beauty, with plenty of size, excellent flesh, and soft touch. She, too, has had a career of marked success, having at the Devon County, Bath and West of England, Taunton, and other Shows, carried off seven first prizes and three seconds. This cow cannot fail to leave behind her some stock of a very superior description. The fourth prize went to Mr. Benjamin St. John Ackers, for his "Lady Carew 2nd," highly commended as a heifer at the Bristol Royal. She displayed a capital rib and other good Shorthorn points, but her rumps were patchy and overhanging. Her Majesty the Queen, besides taking, very easily, the "reserve" ticket, had one other fine cow, "Benedicta," bred at Windsor, shown in this class. Of the "commended" cows, Mr. W. A. Mitchell's "Alma," with calf at foot, and Lord Ellesmere's "Blooming Bridesmaid," pleased me very much; while Mr. T. H. Miller's "Ringlet 5th" is a massive beast, fit to win in more than ordinary company. And last but not least worthy of mention came Lady Pigot's "Rosalba," bred by Mr. J. Stratton. Not one in the class carried a better rib, and she well deserved her "commended" card.

Class 62. *Two-year-old-Heifers in-Calf or in-Milk.*—This class the Judges only described as "very fair," and they selected for the red rosette "Azucena," bred and exhibited by Francis J. S. Foljambe, Esq., M.P. Possessing, as she did, well-arched ribs, long quarters and heavy flesh, I reckoned her "highly deserving," though her hair, which was abundant, might have been softer, and her touch more pleasing. The Duke of Richmond and Gordon's "Chief Lustre" was not a good second; she was deficient through the heart and in the thighs, and a trifle low in

the back. Mr. David Pugh's third prize, commended last year at Bristol, was well-filled behind the shoulders, and had grand crops, with, however, a slight want behind them; her hair was rich and plentiful, but her touch might have been improved. The same breeder had another exhibit in his "Czarina 12th," which, though not mentioned by the Judges, was well entitled to that distinction. She had a particularly good twist and big loins. Mr. Brassey's fourth prize was a large-framed heifer, as wanting in style and quality as in good manners to visitors! She also showed some patchiness in the rumps. Her Majesty the Queen took the "reserve" ticket in this class; while Mr. Kingley's pair, not noticed, had a great deal to recommend them. Mr. Garne also showed a rare good one in "Portrait 12th." No one need desire to see a firmer better loin, nor richer hair and quality. Mr. Benjamin St. John Ackers's heifer was discarded by the Judges on account of her dark nose, although in form and style and quality she has few equals.

Class 63. *Yearling Heifers.*—This was one of the best of the Shorthorn Classes, and had the additional credit of furnishing the champion female in Mr. T. H. Hutchinson's magnificent heifer "Gainful," 1 year and 8 months old, sired by "King Alfonso" (36,832), and from the same breeder's fine cow "Grateful," the first in her class, and already noticed under Class 61. Here, as in the Aged Bull Class, there was much disputation as to the correctness of the award, very many competent judges preferring Lord Fitzhardinge's second prize to the Catterick champion. Much of this wrangling, however, was traceable more to the "Booth-versus-Bates" feeling than to the actual merits of the two animals, as a close analysis of their respective points showed. The ribs and back of the Yorkshire heifer form a perfect circle; she is good all along the top; her hind-quarters are very long and well-filled; twist excellent; bone fine; head good; neck-vein very large, and her hair is like silk. Barring a slight want above the hock, and a little flatness behind the shoulder-blade, it would be difficult to improve her. Of course she was shown in the very pink of condition, as the Catterick stock always are.

The second-prize heifer, on the other hand, is said to have "gone off" since last year, when she stood first as a calf at the Bristol Royal. At Kilburn she looked too prominent in the hips, with rumps slightly overhanging. Her hair, however, is of the richest, and her touch delightfully mellow, while her breast and shoulders and general outlook are perfect; her head, too, is sweet, and her eye prominent. The third-prize heifer,

bred and exhibited by Messrs. Hosken and Son, has well-sprung ribs, capital hair and touch, is particularly good behind the shoulders, but is inclined to slight patchiness behind. This heifer was second to Lord Fitzhardinge's at Bristol last year. Mr. Pugh's fourth prize, "Tulip 4th," was stiff under the hand, but possessed a grand loin, short legs, and rich full coat. The "reserve number," also exhibited by Mr. Pugh, was a very pretty heifer, showing great width of back and fine bone. The Earl of Dunmore had an almost perfect exhibit in this class, one of his famous "Red Roses"; and it was matter of surprise to very many why she had been passed over by the Judges. Her hind-legs were the best in the class, her quarters are long, twist wonderful, chine broad, loins and crops singularly good, shoulders and bosom beautiful. A slight plainness at the setting on of the tail was her only defect. In addition to these I may favourably mention "Diadem 5th," shown by H.R.H. the Prince of Wales; "Cassia," the property of Mr. Maxwell Gambleton, County of Waterford, and first prize at the Royal Dublin Show in April; "Snowdrop," from Lord Ellesmere's herd; "Premium 7th," owned by Mr. George Garne; "Bridal Wreath," from the stalls of His Grace the Duke of Northumberland; and "Cleveland Lass 3rd," who deservedly won for Lord Feversham a "commended" card.

Class 64. *Heifer-calves.*—These again, like the preceding, were all commended, the Judges, moreover, being unanimous in all the decisions. Her Majesty had two entries, very pretty heifers, and well deserving honourable mention. Lord Fitzhardinge took a well-merited first with "Lady Wild Eyes 15th," sired, as was his Lordship's second-prize yearling heifer, by the 4500 guinea bull, "Duke of Connaught" (33,604). She is straight and broad in the back, with a beautiful bosom, hide a trifle heavy but lifting well, quarters broad and firm, a slight drooping behind being noticeable. Mrs. Sarah Jane Pery, of Ballina, Ireland, had an easy second in her "Madeline Benedicta," by "Royal Benedict" (27,348), the slight defect through the heart being compensated for by her magnificent twist, prominent neck-vein, fine head and eye, and rich heavy covering of hair. With common luck this youngster will be heard of again. "Lady Ashton 4th," half-sister to the first prize, took third honours for Sir J. H. G. Smyth, Bart., of Ashton Court. This youngster showed round ribs, big crops, and other valuable points, and, if I mistake not, more honours are in store for her. The fourth prize was awarded to Mr. W. H. Wodehouse for "Countess of Woolmers 2nd," whose dam showed to such advantage in the Family Class. Messrs. W. Hosken and Son

were again to the fore with "Rose of Oxford 4th;" while Mr. Wm. Handley, an enterprising breeder from Westmoreland, and winner of first honours in Yearling Bulls, was "highly commended" for "Queen Mary," by "Alfred the Great" (36,121).

Class 65—*for the best "Cow and not less than two of her offspring (bull, cow, or heifer)"*—formed one of the most interesting and useful features of the Cattle department. The Marquis of Exeter was by common consent at once awarded the first prize for his group of five animals, namely, the eleven years old but still wonderfully fresh cow, "Sea-Gull," and four of her produce —two bulls and two heifers—all got by the world-renowned Royal bull "Telemachus" (27,603), the hero of many a keen contest in the Show-ring. Four of them being cast in the same mould, and got by the same bull, a remarkable family likeness characterized this collection of heavy-fleshed, thickly made Shorthorns; and that the decision was a popular one was evidenced by the closely-packed crowd of admirers which, throughout every day of the Show, surrounded the Burghley lot. Colonel R. Loyd Lindsay, V.C., took, very deservedly, both second and third prizes here, with his "Princess Rose" and her three sons, and "Burlesque" and four daughters, respectively. The latter stood first in this class at Bristol last year, and it appeared that they were only on this occasion kept from second place by the slight patchiness displayed by two members of the group. The "highly commended and reserve" lot were owned by Mr. W. H. Wodehouse, whose wonderful old cow, "Countess," winner now of fifteen first prizes and the dam of ten calves, I well remember, with twin-calves by her side, taking first honours in the Cow-class at the Dairy Society's Show in London last October.

Champion Classes.—It now became the duty of the Judges to award the 100*l.* prize for the best Shorthorn bull in the yard. The much-coveted trophy was soon seen to lie between Lord Rathdonnell's Aged Bull, "Anchor" and Lord Exeter's "Telemachus 9th," the latter sent to compete for the Family Prize, and therefore not found in Class 57. The Irish Judge, Mr. Chaloner, being the breeder of "Anchor," again withdrew from the ring, thus compelling Messrs. Drewry and Mitchell, who were divided in their opinions as to the merits of the two animals, to seek the assistance of a referee. Accordingly the Steward in attendance set off in one direction, while his assistant betook himself in another, to find out, as quickly as possible, some fit and proper man to decide the knotty point. Such an one was soon met with in Mr. Richard Stratton, and he, after briefly scanning the two

rivals, awarded the palm to "Telemachus 9th." The decision, though approved by the majority, was warmly criticised, many experienced breeders maintaining that the great style and evenness of the Irish bull entitled him to the premier place; while those who, like Mr. Stratton, went for heavy flesh and plenty of frame to build it on, said the verdict could not have been against the Burghley bull. One word as to the mode in which the referee—an able man, it is true—was appointed. Surely, to use a mild term, it must be regarded as careless and unbusiness-like. A prize of such high money-value, to say nothing of the "honour and glory" which so proud a position very properly carries with it, ought not to be left to the mere hap-hazard of what man may be hurriedly found among the miscellaneous crowd of a busy Showyard. For I make bold to say that had the Assistant-Steward been the first to find a man to his mind the decision would have been reversed. The Council will do well therefore to provide, in future, for a like emergency: they, and not the Ring-Steward, should appoint a referee before the judging begins.

The Champion Plate of 100*l.* for the best Shorthorn cow or heifer was awarded to Mr. Teesdale Hutchinson for his very pretty heifer "Gainful," aged 1 year and 8 months, already described under Class 63.

I give below the Report of the Judges of Shorthorns:—

Class 57. This was a very good class. In it were many old bulls which in previous years had been Royal winners. Though they were all worthy of commendation, we thought them past their best. We were not unanimous in our decision in this class; one of the Judges would have placed No. 755 first.

Class 58. This was not so good as Class 57. The prize animals were good, but we did not commend any others.

Class 59. This was a very fair average class.

Class 60. Some very good calves in this class.

Class 61. Very good. Ten animals in this class received prizes and commendations. We were not unanimous in our decision for the first prize; one of the Judges would have placed No. 834 first.

Class 62. A very fair class. No. 852 would have been one of the prize animals had his nose not been rather dark.

Class 63. This we think was as good as any that came before us. We did not agree as to the first prize; one of us thought No. 875 should have been first.

Class 64. A very good class. We agreed in all our decisions.

Class 65. The Family Class. There were some very good families shown. No. 922 won very easily; but 917 and 918, the second and third, were both very good, and 919 ran them very hard.

The Cup for the best Shorthorn Bull was awarded to one of the bulls shown in group No. 922.

The Cup for the best female was awarded to No. 822 in Class 63.

In awarding the Cup for the best Bull one of the Judges declined to act, as he was the breeder of one of the competing animals. As the other two Judges

differed in their opinion, another gentleman was called in, who, after examining the animals, decided in favour of No. 922.

From this Report it will be seen that we were not unanimous in all our decisions. This cannot be wondered at when it is known that we are breeders of such different types of animals.

GEORGE DREWRY.
RICHD. CHALONER.
ANDREW MITCHELL.

HEREFORDS.

Though not present in large numbers, this breed was sufficiently in force to show its excellence as beef-producers as against milk-givers. Mr. Aaron Roger's "Grateful," winner of the first prize in the Aged Bull Class, and subsequently of the Champion plate as best male Hereford, is a magnificent specimen of the sort. He stands on short legs, is very prominent in front, but shows a little short and round at the tail-head. Last year, at Oxford, he carried off the open Champion cup, beating the Royal Shorthorn bull, "Sir Arthur Ingram." The second prize, "Thoughtful," owned by Mr. William Taylor, is not far short of his more favoured rival, the hind-quarters being better than those of "Grateful." Both bulls are well covered with thick heavy flesh. Of the other two to which tickets were awarded, many onlookers preferred Mr. Lutley's "Cupid," whose big forearm, well-sprung rib, and heavy flanks, made him a dangerous antagonist.

In the Two-year-old Bull Class there were only three entries, all brought to the ring. "Anxiety," the winner, is singularly neat and well-proportioned throughout, with rounds remarkably developed, hence he ran "Grateful" very close indeed for the championship. Besides local prizes, his dam can boast of three firsts at the "Royal," and a like number at the "Bath and West of England" Shows. Mr. Thomas Thomas, of Cowbridge, South Wales, was deservedly awarded the "reserve" ticket for his very valuable bull, "Goldfinder."

The Yearling Bulls were a remarkably good collection, each one of the five exhibits taking a ticket out of the ring. Bull-calves, Class 69, though a very creditable and promising lot, call for no special mention.

Hereford cows were easily topped by Mrs. Sarah Edwards's magnificent "Leonora," specially referred to by the Judges in their Report which follows (p. 616). Though shown in a condition far too high for a breeding animal, this cow was undoubtedly the best Hereford in the yard, if not the most perfect female in any of the cattle classes. The girth of her long and cylindri-

cal barrel is simply enormous, and the covering of flesh and fat of prodigious thickness. She is described as in-calf, and it is to be hoped that she may get well through her troubles. Should she fail to breed, she will indeed be dangerous at Islington or Bingley Hall. "Lady Blanche," the second prize, was also owned by a lady; and if the patchiness behind were not visible, she would be a grand cow; her fore-flank would have done credit to "Leonora" herself. There were three absentees in the cow class, thus reducing the number to five only. Heifers in-calf or in-milk, and under three years old, were also a thin show. Mr. W. Taylor, owner of the second-prize aged bull, took first honours with a wealthy fine young beast; while Mrs. Edwards was again in the front rank with "Spangle 3rd," which had calf at foot, and showed a remarkable front and excellent quality of flesh. The third place was awarded to "Duchess," exhibited by Mr. Williams, of Cowbridge, and bred by Mr. Tudge, of Adforton, Hereford. Yearling Heifers were a more numerous class, every animal gaining either a prize or a commendation. Mr. J. H. Arkwright, of Hampton Court, Leominster, carried off both first and second prizes with a neat heavy-fleshed pair, bred by himself, and got by his "Ivington Boy," No. 4662. Mr. Thomas Thomas, of Cowbridge, a very successful breeder of the white-faces, took third honours with "Lady 3rd," a very gay and improving heifer, and Mr. F. Platt the reserve with "Bannerett 2nd," close on two years old. Mr. W. Taylor gained a commendation for "Heroine," a well-haired heifer, with enormous loin and flank, but grossly fat. Heifer-calves, seven in number, were contributed by Her Majesty the Queen, Mrs. Edwards, Mr. Thomas Thomas, Mr. Arkwright, Mr. W. Taylor, and other well-known breeders of Herefords, but space does not allow of the class being described seriatim.

The Family Class of this breed formed an excellent collection—four entries, and all to the fore. The first prize was secured by Mr. T. J. Cawardine, owner of the grand young bull "Anxiety" (Class 67), and hence this exhibitor might well have been mentioned above in the list of successful Hereford breeders. His group, consisting of the seven-year-old cow, "Cherry," and two daughters, were indeed a beautiful trio. The second prize went to the Earl of Coventry, again for three females, while third honours fell to Mr. Taylor, who has been so often mentioned as a prize-taker in this section of the Show.

The Judges of Herefords sent in the following short Report:—

We have satisfaction in being able to report that the weakness in numbers in some classes is amply compensated by excellent quality generally, as a very

large proportion of the animals exhibited possess massive and true form with remarkably deep and level flesh—patchy backs and gaudy rumps being quite the exception. The Champion Bull was closely pressed in his class by "Thoughtful," but the beautiful head, well-covered shoulders, and very heavy and level flesh throughout, turned the scale in favour of the former. The Champion female, the distinguished "Leonora," never appeared in better form. We consider her the best Hereford cow we ever saw, and probably a more perfect specimen of any breed is not in existence.

H. Haywood.
Francis Evans.
John Crane.

Devons.

Though numbering only a trifle over fifty entries, these reds were, as usual, wherever they are shown, second to none in neatness and in the best beef-points. Lord Falmouth, Mr. Walter Farthing, and Mr. W. R. Fryer were the principal prize-takers. In the Aged Bull class, four entries, his Lordship secured first honours with "Sirloin," No. 1443, whose abundant and firm flesh must have pleased the most fastidious; the second prize went to "Sir Copplestone," bred by Mr. J. Gould, and exhibited by his successor, Mr. Albert Gould. In the class of Two-year-old Bulls, Mr. W. Farthing scored a win, but was closely pressed by Lord Falmouth with a nameless son of "Duke of Tregothnan;" the third place being secured by Colonel Buller, C.B., of Downes, Devonshire. In the class of Yearling Bulls, Lord Falmouth was again first, with a more than creditable son of "Sirloin," winner in the Aged Bull class; and Mr. Walter Farthing followed very closely with a youngster only thirteen months old, sired by "Nelson," dam, "Duchess 2nd," by "Forester." In the class of Bull-calves, which were a pretty and even lot, Mr. W. R. Fryer had three exhibits, taking first and third prizes with "Sweet William" and "Daffodil" respectively, Colonel Buller being again third.

The Cow class reached only seven entries, but the entire lot were so meritorious as to gain a general commendation from the Judges. Mr. Walter Farthing's "Pretty-face," well known in many a Show-ring, was placed first, and afterwards carried off the Champion plate as the best Devon female. Mrs. Langdon took the second prize with "Temptress 8th," a very neat cow, showing a long line of pedigree. "Comely," owned by Mr. William Perry, made a good third; while "Gipsy Girl," No. 4531, with a capital calf at foot, had many admirers, and gained a commendation.

The Heifers in-calf or in-milk (Class 80) were headed by "Prettyface 2nd," a most promising daughter of the first-prize cow, and sired by "Master Willie." Mrs. Langdon had an ex-

cellent second in one of her "Temptress" sort; and Her Majesty took third with "Princess Beatrice," a well-grown and well-proportioned heifer, bred at Windsor. Yearling heifers were a numerous and promising display, Mr. W. R. Fryer again showing three, and taking first and third tickets, the former with one of Lord Portman's breed. Mr. Walter Farthing's "Famous 2nd," another charming daughter of "Master Willie," looked all that her name implies, and very deservedly stood second; while Mr. Walter's, M.P. "Highly commended and reserve," was wellnigh getting a higher place. Of Heifer-calves there were only three, and two of them belonged to Mr. W. R. Fryer, who had to succumb, however, to Mr. W. Farthing's "Famous 3rd," half-sister to his second-prize yearling heifer. All three could have held their own in a more numerous class.

The Judges of Devons report, briefly but pithily, as follows:—

In compliance with a request made to us by the Council for the Judges of the several departments to make any special comment they may think desirable upon the animals that were brought before them,

We the undersigned, Judges of the Devon classes, beg to say that although the entries were not so numerous as might have been wished, there were, nevertheless, animals of very great merit in each class, and this we look upon as unmistakable evidence of this distinguished race of cattle receiving a marked degree of attention in careful and judicious breeding. This we hope the Royal Agricultural Society of England will continue to encourage in the same liberal manner it has hitherto done, so that the Devon ox, with its majestic head, symmetrical and well-developed form of first-class flesh, may maintain the prominent position it has hitherto held at the Smithfield Show; and, when slaughtered, that its "Baron" may be in as much favour as hitherto at the palace and in our old baronial halls.

Samuel P. Newbury.
John Overman.
William Bullen.

Sussex.

Exhibitors of this hardy beef-yielding breed, cannot be too highly complimented on the extraordinarily fine classes they brought out at Kilburn. Many a one was heard to exclaim to those near him, "But have you seen the Sussex cattle!" Equally with the Channel-Islanders, they formed one of the main features of a generally splendid exhibition of the bovine race. To one not acquainted with the characteristics of the breed, Sussex cattle might be easily mistaken for Devons; but on a closer examination, while yielding little to the latter in neatness of form or quality of flesh, they will be found to possess a bigger frame and more bone, with, however, the largest growth of fine

beef on just those parts which are worth most per pound. Comparing the two, a breeder of Sussex beasts was heard to say in the Showyard, that a steer of his fancy sort would, "at two years of age, be as heavy as the Devon at three years." This remark went unchallenged, because no Devon man was present. However, to keep within the line, let six months instead of twelve be put to the credit of the manifestly larger sort.

The Right Hon. the Speaker of the House of Commons showed some excellent animals in this department, and gained with them several well-merited honours. The fine old bull "Dorchester," owned by Messrs. E. and A. Stanford, and first last year both at Bristol and Oxford, had on this occasion to give place to "Young Hartley," who also came second in the Champion Bull competition. He carried a fine open head and horn, but was a trifle light in front, and plain at the rump end. In the champion bull "Oxford," No. 304, owned by Mr. J. S. Hodgson, of Haslemere, only one fault was observable, namely, a slight deficiency in the rounds. Mr. J. S. Oxley had a fine bull in this class, standing better on his hind legs than any of his rivals, but he did not secure a card. "Bouncer," the first-prize cow, and champion of the Sussex females, was a marvellously fine type of the breed; she had great length of body and rich quality. With calf at foot, and an abundant udder, she showed attractively. "Primrose," who took second honours, was rather "on-leg," with up-standing horns, but showed a famous milk-vessel. The Right Hon. the Speaker exhibited a very neat and pretty cow, "Beauty 2nd," which might well have been noticed by the Judges. The Two-year-old Heifers were headed by Mr. Braby's "Rival," first as a yearling last year at Bristol, and champion female here, but she was closely pressed by Mr. C. Whitehead's "Cherry Jam," of true Sussex character. Of Classes 89 and 90 (Yearling Heifers and Heifer-calves), nothing more need be said than that they were both commended in their entirety. Indeed, I have felt that, had it not been for the marked excellence of the Sussex classes throughout, not one word need have been added to the very full and very carefully prepared Report of the Judges in this Section. It is as follows:—

Judges' Report on Sussex Stock.

Class 83. *Bull above Three Years old.*—Eleven entries, one of which was absent. No. 1048 is a bull of nice quality, with grand hind-quarters and great depth of brisket and width of shoulder, altogether of good character, to which we were unanimous in awarding the first prize. No. 1045. Second prize, is a grand old bull, heavy in flesh but of good quality, very level, and of apparently good constitution, his age showing a few defects,

detracting from the bloom required in a showyard. No. 1051, third prize, is a very useful animal, showing good breeding.

Class 84. *Bull above Two and not exceeding Three Years old.*—Eight entries. First prize, No. 1053, an exceedingly nice animal, of good quality and nice touch, will probably be conspicuous again in the Showyard. No. 1057, second prize, has good symmetry and character, very fair in hand, and will also without doubt be heard of again. No. 1059, third prize, is a fine animal of superior touch and quality, but defective in the formation of the shoulder. There were in the class other good specimens, which will show to advantage probably in local Shows.

Class 85. *Yearling Bull above One and not exceeding Two Years old.*—Fourteen entries; first prize was awarded without hesitation to No. 1064, very level, good colour, perfect in shape, and without doubt one of the gems of the Exhibition. No. 1068, second prize, has good symmetry and touch, but his coat is not good, which age will perhaps rectify. Third prize, No. 1065, is a nice young bull, showing good breeding, but not equal in symmetry and character to the one awarded the second prize. There were other animals in this class of considerable merit.

Class 86. *Bull Calf above Six and not exceeding Twelve Months old.*—Nine entries. No. 1075, first prize, was far away the best, indeed the only good one in the class. No. 1076, second prize, is long and level, with good touch, but a plain head. He will evidently develop into a good animal.

Class 87. *Cow above Three Years old.*—There were sixteen entries in this class. No. 1099 was awarded first prize, without difficulty. She is indeed a grand cow, with great size, perfect symmetry, of good quality, and beautiful touch; one of the best Sussex cows ever exhibited, and it may also be said that she was one of the gems of the Show. We had considerable difficulty in arriving at a decision for the second prize; but, after careful comparison, we gave it to No. 1088, the oldest in the class, not perfect, but possessing points which we considered entitled her to the pride of place over No. 1085, which we awarded the third prize. Excepting the first prize in this class, there was nothing particular to notice.

Class 88. *Heifer, in-Milk or in-Calf, above Two and not exceeding Three Years old.*—There were nine entries, one of which was absent. No. 1107, to which we awarded the first prize, was a fine specimen of the Sussex breed, faultless in symmetry, touch, colour, quality, and general character. No. 1108, second prize, was little behind her fortunate rival in merit; her colour was not so good, and although of great size for age, she was of excellent quality. To No. 1103, we had no difficulty in awarding the third prize, although there were others possessing considerable merit.

Class 89. *Yearling Heifer above One and not exceeding Two Years old.*—Eleven entries, of which one was absent. There was very keen competition in this class; an exceptionally good lot. No. 1110, first prize, is very handsome, perfect in shape, with great width, having a nice touch; and although run close by No. 1109, which took second prize, is well entitled to the premier position. No. 1113, third prize, is a sweet heifer, and worthy of the honour. The remainder of this class were so meritorious, that they were justly entitled to be commended.

Class 90. *Heifer Calf above Six and not exceeding twelve Months old.*—Never before were seen together such a grand lot of calves of this now acknowledged famous breed, not one of which was unworthy to compete at a Royal Show. No. 1125 we considered the most perfect specimen; she is good at all points, a little wanting in mellowness of touch, but, if fortunate, she will develop into a grand cow. It was gratifying to see a lot of calves of such quality in competition, which clearly indicates farther improvement in this

useful breed. No. 1126, second prize, has nice quality, good coat, colour and character. Nos. 1122, 1132, 1134 were of great merit; and the remainder of the class so good that we could do no other than commend them.

The Champion prize for males was awarded to the yearling No. 1064; the reserve number being in the old class, No. 1048.

The Champion prize for females was given to No. 1099, in the Cow class; the reserve number to No. 1107, in the In-Calf Heifer class.

JOHN NOAKES.
JOSIAH PITCHER.
THOMAS FULCHER.

LONGHORNS.

The history of this breed has so recently been described by Mr. Nevill Fitt in the pages of this Journal,* that it will be sufficient here to mention that about thirty years ago entire herds of this picturesque useful breed were few and far between. It may also be mentioned here that until quite within recent date Longhorns were not allotted separate classes at the Royal Shows; they simply competed in a mixed or miscellaneous class of "crosses, or any other breed," from which Shorthorns and the more favoured breeds were excluded. In 1862, however, at Battersea, separate classes were opened for this interesting old-established race, and the result was a display such as to convince even opponents of the breed that, far from becoming extinct, the "curly-coats" were in the ascendant. Stimulated by their success at this the first international gathering, and by the admiration bestowed on their exhibits by shrewd practical men, the leading breeders—to wit, His Grace the Duke of Buckingham and Chandos, and many others too numerous to mention—endeavoured, like the north-country wrestler, to "mend their hold," and, having done this, they seem determined to keep it. At any rate it must be honestly admitted that Longhorns are extending themselves beyond their original home of Leicestershire, Warwickshire, Staffordshire, Derbyshire, and the adjacent counties; and it was plainly visible from the classes at Kilburn that, in addition to the formation of a Longhorn Herd-book, very great care indeed is now being bestowed on their cultivation. Great length of frame, deep ribs, well-covered backs and loins, heavy flesh, majestic carriage and remarkable similarity, are outwardly visible marks of the breed; while they enjoy a reputation for yielding, on poor herbage, a fair measure of milk, singularly rich in caseine (or cheese), and producing quite the average percentage of butter; and when slaughtered they abound in lean flesh, and weigh well to their appearance. And now a few words on the classes.

* Second series, vol. xii., p. 459, 1876.

In the Aged Bull class "Conqueror 3rd," after having scored for His Grace the Duke of Buckingham three Royal firsts in succession, had to give place to "Prince Victor," the champion bull, shown by Major-General Sir F. W. Fitzwygram, Bart., who is a recent convert to the breed. The latter was slightly narrow when viewed from the rear, but he displayed marvellously long hind-quarters, carrying lots of grand heavy flesh, great depth of chest, big loins, deep flank, and perfect head; crops slightly wanting. "Conqueror 3rd," though carrying age well, seemed a trifle tucked-up in the flank, short in the quarter, and rough at the tail-head. The third prize had grand rounds, immensely long quarters, good crops, loins slightly down. In Two-year-old Bulls, as also in yearlings, Mr. John Godfrey, a Leicestershire breeder, took first honours, the second prizes going to His Grace the Duke of Buckingham and Mr. W. S. Shaw (of Lichfield) respectively.

Cows were a large and meritorious class, and were headed by his Grace's "Countess of Temple," who also proved the champion of Longhorn females. The second prize went, very deservedly, to "Fairer," owned by Major-General Sir F. Fitzwygram, Bart., and apparently a famous milker, with well-formed shoulder, good chine, deep foreflank, and better head and horn than the first-prize cow. In the Two-year-old Heifer class, both first and second prizes were taken by Mr. Richard Hall, of Derby, who has lately taken to Longhorns, while first honours in yearlings fell to the same exhibitor, for "Lady Fanny," only six months old, and a truly promising beast, destined, with common luck, to win many another Royal prize. Mr. Hall had altogether ten entries, a highly creditable lot.

Welsh.

This hardy and active breed, so well adapted to the cold and damp districts of Wales, was shown in larger force than might have been expected, considering that they were only allotted five classes, namely, two of males and three of females; and all the entries had the recommendation of being brought forward in moderate everyday condition. The Earl of Cawdor and Captain J. C. Best divided most of the leading prizes. The first-prize Aged Bull, exhibited by his Lordship, was a fine massive beast, having large solid rounds, deep sides, and great length of body, with some plainness about the tail-head. In the Yearling Bulls, "Black Prince," owned by Captain Best, was one of the best of the breed, his grand level top, good underline, deep flank, and heavy flesh, proclaiming him a highly promising youngster. His ribs alone might have been improved by a little more of

the arched form. Cows were an excellent lot of eight, and to all but one was a card of merit awarded. Captain Best's first-prize cow was closely pressed by Mr. Edward Elias's "Mwynic," a rare sort; while Earl Cawdor's third-prize cow was wonderfully fresh for a ten-year-old. Of Heifers in-calf, Mr. Elias showed the best, having capital back-ribs and loin, though rather small in the horn; in the latter feature she was surpassed by Mr. C. S. Mainwaring's second prize, whose fine open horn, round barrel, and grand loin marked her out as a dangerous rival. In Yearling Heifers, Mr. Griffiths, of Tenby, stood both first and third, with two half-sisters. The first, though a lengthy stylish heifer, betrayed a slight thinness through the heart, and was rather crooked in her hind-legs.

Other British Breeds.

The Bull class here was especially noticeable as furnishing the much-admired and singularly interesting bull "Adam," exhibited by the Earl of Tankerville, and the result of a cross (the first experiment of the kind ever made) between one of his Lordship's "Chillingham Wild Bulls" and a pure-bred white Shorthorn dam. His fine big loins, large fore-shoulder, deep flanks, long hind-quarters, lengthy carcass, and "Booth" head, might betray one into the belief that he was a pure Shorthorn, while the red-tipped ears and speckled forefeet, all so characteristic of the wild cattle, point to his true descent. The peculiar brown muzzle seemed to strike midway between the black nose of the sire and the light, flesh-coloured nose of the dam. "Adam," though showing two capital ends, was deficient in the fore-ribs; still, he well merited the first prize, beating a pure Shorthorn bull-calf, exhibited by Mr. Blott.

And here I gladly submit the

Report of the Judges of Longhorns, Welsh Cattle, and other British Breeds.

Class 91. The breed of Longhorns we consider are well represented in this class; the first- and second-prize animals competed at Bristol last year. We perceive that the decisions then given are now reversed, the Duke of Buckingham's old bull having to give place to his antagonist; but the Duke's old bull carries his age well.

Class 92. In this class the Judges consider No. 1143 possessed of sufficient merit to entitle him to the second prize, and recommend that it be awarded to him.

Class 93. A good class, shown in fine condition, doing credit to the exhibitors.

Class 94. A grand class; the Judges were some considerable time in making their decisions, the competition being very close and severe.

Class 95. This was an excellent class, highly creditable to the exhibitors, the competition between the first and second prize-animals being very close.

Class 96. With this class the Judges were much pleased, and, in addition to the prizes, commended the whole class.

Class 112. The Judges were well satisfied with the Class of Old Bulls; they doubt if the Welsh breeds of cattle were ever so well represented as they have been in this exhibition; they venture to express an opinion that, considering the importance of Welsh cattle to English graziers, the Royal would do well to continue to encourage the exhibition of these cattle.

Class 113. A useful class.

Class 114. In this class the Welsh cattle were well represented, and were highly creditable to the exhibitors; the class generally was commended.

Class 115. A very useful class of animals.

Class 116. This class was well represented by animals giving promise of growing into first-class cows.

Classes 135 and 136 call for no particular comment.

J. H. Burbery.
W. B. Roberts.
Rowland Hughes.

Jerseys and Guernseys.

The Jersey cattle at Kilburn, extending to the unprecedented number of 252 entries, were admitted on all hands to be *the* feature of the Live-stock department. To quote, for once, the words of a well-known and distinguished agricultural writer, it did seem as if "the butter had come to the top," and a bountiful, well-shaped udder grown at length more in favour than beastly obesity! I shall have more to say on this milk question when the Dairy Class is under notice. Suffice it here to remark that, weight for weight, it may be fairly conceded that Jersey cattle take first rank as producers of deliciously flavoured, richly coloured milk and butter. And over and above these valuable qualities, might not a whole chapter be written on their delicacy of form, their deer-like head and neck, their mouse-like skin, their prettily marked muzzles, their docile temper, their intelligent looks? Passing through the class one day, an observant visitor said to me, "Those creatures would be as pretty as deer in a nobleman's park." I made answer, "Yes, and vastly more profitable."

Guernseys, though mustering in slender force (only 38 entries), were of rare quality, and displayed, in many instances, those enormous milking propensities which have made them so highly prized by the small peasant or cottager with his one cow. Though not so neatly formed as the Jerseys, being larger in bone and somewhat coarser in build, they furnish, when their natural career for breeding and milking is ended, a wider and bigger framework on which to build up something for the butcher. Jerseys, on the other hand, are not easily fattened, and when sent for slaughter are not satisfactory weighers.

Two of the Judges of these classes have, to their great credit,

furnished me with a Report so elaborate and so full of detail that no words from me are needed: and I here append it, merely stating that the third Judge declined to sign it:—

The request from the Council to the Judges that an ample report should be made in the several classes in competition calls on our part for an expression of opinion on the general, and in some instances on the particular, merits of the animals which were before us.

The total number of entries in the Jersey and Guernsey Classes testifies more than any words to the great interest which is taken in this section of the Society's Exhibitions, and the growing importance of these valuable dairy-breeds.

The examination of the ten classes did not terminate till the close of the day, nor was this termination arrived at without the best attention having been given throughout the examination.

JERSEY CATTLE.

CLASS 97. *Bulls above Two Years old.*—This class comprised twenty-four entries. The prizes were awarded as follows:—No. 1192, first prize; No. 1202, second prize; No. 1193, third prize; and No. 1194, reserve: highly commended, Nos. 1182, 1191, 1194, and 1195; whilst the class was generally commended. The animal to which the first prize was awarded was particularly good in quality; the fineness of horn, with its golden tint, were here very noticeable, whilst the general features of the bull denoted character and good breeding. The exception which might be taken to its form was a slight defect at the setting of the tail, which was rather short. The champion prize was awarded also to this animal as being the best male of the breed in the Exhibition. The second prize, No. 1202, calls also for special notice in point of merit, which was scarcely distinguishable from that in the first-prize bull.

CLASS 98. *Yearling Bulls above One and not exceeding Two Years old.*—In this class, which has probably never been equalled, no less than forty-four animals competed. The most capricious tastes might have been satisfied. The variety of colour ranged from the darkest to the lightest tints, whether in greys or in browns, whether self-coloured or mixed; but in this as in all classes, the selection for prizes was made on the one broad principle of real merit—*quality and symmetry combined.* The prizes fell in the following order:—first prize, No. 1234; second prize, No. 1233; third prize, No. 1235; reserve, No. 1243; highly commended, Nos. 1243, 1205; commended, Nos. 1211 and 1222; and the whole as a class were highly commended.

CLASS 99. *Bull-Calves.*—This brought together twenty in competition, and was the weakest of the Bull Classes. No. 1248, which obtained the first prize, was vastly superior to anything competing against him. This animal promises well. The second prize was awarded to No. 1260, and the reserve to No. 1250.

CLASS 100. *Cows above Three Years old.*—There were forty-three entries. Though large and excellent, this class did not produce any serious difficulty in the award of its prizes. There was in some of the animals a decided superiority which was unmistakable. The first prize was taken by No. 1296, the second prize by No. 1299, the third prize by No. 1272, and the reserve by No. 1301; which was also highly commended with No. 1281; whilst commendations were given to Nos. 1277, 1276, 1271, 1293, 1306, and 1283.

CLASS 101. *Heifers in-Milk or in-Calf, above Two and not exceeding Three Years old.*—In this there were forty-seven entries. From the fact that animals in full milk, and others which have never yet calved, were competing together, differences of opinion arose more frequently on the relative

merits of the animals thus shown together, and from which it must be understood that a relative difficulty equally arose in the determination of the awards. If it were possible in the future to divide the heifers in-milk from those in-calf, the difficulty would thus be removed, and the animals with fully developed udders and in milking condition would not be competing against those whose udders may not yet be fully developed, and whose condition is totally opposed to that in which an animal when in-milk should be. The prizes in this class were awarded as follows:—first prize, No. 1355; second prize, No. 1316; third prize, No. 1344; reserve, No. 1340, which was highly commended, as also No. 1352; and Nos. 1321, 1341, 1343, commended. The entire class deserves special mention; it was good throughout, and many were the animals which, though not prize-takers, would in former years have been adjudged worthy of the foremost rank. The champion prize was awarded to No. 1355, as being the best female of the breed exhibited.

Class 102. *Yearling Heifers above One and not exceeding Two Years old.*—This, as the last, was a very interesting class, and with an equal number of entries. No. 1362 obtained first prize; No. 1393, second prize; No. 1371, third prize; and No. 1394, reserve and highly commended; the latter distinction being also accorded to Nos. 1381, 1403, and 1391; and commendations to Nos. 1375, 1373, 1368, 1363, and 1396.

Class 103. *Heifer-Calves.*—A very promising lot, numbering twenty-three entries, many of which will, no doubt, appear again. The prizes were awarded—first prize to No. 1425, second prize to No. 1422, and the reserve to No. 1427, which was highly commended, as also Nos. 1428 and 1416; and commendations extended to Nos. 1413, 1420, 1426, 1429, 1430, 1412.

Guernsey Cattle.

Class 104. *Bulls above One Year old.*—There were ten entries in this class. Though not numerous, some animals of good form and quality were in competition, the result being—first prize, No. 1433; second prize, No. 1441; third prize, No. 1435; the reserve number, 1438, which was also highly commended; as was equally highly commended No. 1442.

Class 105. *Cows above Three Years old*, was a small but good class of eleven. The first prize was taken by No. 1446, the second prize by No. 1450, the third prize by No. 1452, and the reserve by No. 1447. A commendation was also given to No. 1449. The animal to which the first prize was awarded had a rich appearance, which was also noticeable in some of the other prize-takers.

Class 106. *Heifers in-Milk or in-Calf, not exceeding Three Years old.*—This, though the largest of the Guernsey Classes, numbering seventeen entries, was not proportionately so good as the others. No. 1464, a good animal, obtained first prize; No. 1454, second prize; No. 1465, third prize; while the reserve with high commendation was given to No. 1456, and a commendation to No. 1457.

In closing these observations on the cattle submitted to our consideration and judgment, we cannot fail to congratulate the Council on the great success which has attended the expansion given to the classes of the Jersey and Guernsey breeds at the Society's Exhibitions, and which on the present occasion, in the number of entries, has brought the former at the head of the cattle exhibited, and collectively produced one of the most interesting features of this great international gathering.

Chas. Ph. Le Cornu.
Christopher Stephenson.

Norfolk and Suffolk Polled.

This breed, which has the reputation of flourishing on poor, cold, scanty pasture, was but sparingly represented, the total entry being only 35. Paucity in numbers, however, was fully compensated for by the rare excellence of the prize animals; moreover, several of those to whom prizes did not fall, did infinite credit to the exhibitors. Mr. J. J. Colman, M.P., was, as usual, well forward amongst the leading honours. In Class 107, Aged Bulls, father and son met in friendly antagonism, the junior having, and not for the first time by several, to yield the premier place to his magnificent sire, "Davyson 3rd," exhibited by Mr. T. L. Palmer, of Attleborough. This bull stood on short neatly-turned legs, and was remarkably even all over; his rounds, too, were singularly massive—qualities which he had, in a measure, transmitted to his son. The third ticket fell to Mr. J. J. Colman, M.P. In the Class of Yearling Bulls, Mr. Colman pulled off both first and second honours, the former with "Skobeloff," remarkable for his deep flanks and mellow handling; the latter with an unnamed son of "Rufus," who betrayed weakness along the back, with ribs hardly round enough. The Cow Class was headed by Mr. R. E. Lofft's "Minnie 3rd," showing deep well-covered ribs, prominent brisket, and bountiful bag. The second-prize cow was the property of Mr. J. J. Colman. In the Two-year-old Heifer Class, Mr. Alfred Taylor's "Flirt," the champion female, and a previous heavy winner, stood pre-eminent; while in yearlings, Mr. George Goodenham carried off both first and second honours. The champion plate for males of this breed went to "Davyson 3rd," already described.

The Judges Report on the foregoing Classes is given below:

Norfolk and Suffolk Red Polled Cattle. (*Report of the Judges at Kilburn.*)

Thirty-four animals in the five classes creditably represented this handsome breed.

Class 107. *Bull above Two Years old.*—Five entries; the first prize was easily won by No. 1473, a grand bull, good at all points, and although nearly six years old, as fresh and springy in his gait as a yearling. Second prize, No. 1471, a little over three years old, presents the desirable combination of size with quality. We unanimously recommended No. 1475 for a third prize, notwithstanding that he has a somewhat flat-sided appearance, owing to a protuberant paunch; he is, however, especially good in the thighs.

Class 108. *Yearling Bulls.*—An uneven lot, calling for no special comment except that they are a long way behind their seniors.

Class 109. *Cow above Three Years old.*—No. 1486 was at once selected for first prize, her touch and size being superior, albeit she showed signs of pre-

mature age from high feeding. We had some difficulty in awarding second and third prizes, which ultimately went to Nos. 1491 and 1488 respectively; 1485 being highly commended and reserve.

Class 110. *Heifer in-Calf or in-Milk.*—First prize, No. 1494, a beauty all over. Second prize, No. 1495, a neat heifer in full milk. Third prize, No. 1497, a dark red with excellent hair. Commended and reserve, No. 1493.

Class 111. *Yearling Heifer.*—First and second prizes were awarded to two Suffolks. Third prize, No. 1501; reserve, No. 1499. These youngsters, as a class, are more promising than the young males.

Champion prize of 25*l.* for male to No. 1473.

Champion prize of 25*l.* for female to No. 1494.

In closing our Report we venture to express the hope that the Royal Agricultural Society of England may continue to offer prizes (in separate classes) for these useful cattle whenever their Show is held within reasonable distance of the eastern counties.

July, 1879.

Thomas Fulcher.
John Noakes.
Josiah Pitcher.

Ayrshires.

The entries were disappointing in numbers and, with very few exceptions, in quality also—a circumstance to be mainly accounted for by the long distance of the Showyard from their native home. Mr. Montgomery's first-prize Aged Bull, of temper not the kindliest, displayed a deep projecting brisket, neat forearm, and much true type of the breed. The second prize, only a trifle over two-and-a-half years old, bred by Her Majesty the Queen, and exhibited by Major T. T. S. Carlyon, also showed a lot of Ayrshire character; while Mr. Arkwright's "Robert Burns," not placed by the Judges, was a very useful sire, though a trifle short in the rumps. Yearling Bulls were a moderate class, Mr. Montgomery again heading the lot, as indeed he did in three out of the four classes. His winning cow showed the thin neck, yellow horn, and well-forward udder, all which are infallible marks of this deep-milking sort. The Stand Stud Company, Manchester, exhibited two cows, which stood second and third, both deep-sided and clean made, and evidently great milkers. Mr. George F. Statter, of Whitefield, near Manchester, had three entries here, his No. 1555, commended, being especially noticeable. Two-year-old Ayrshire Heifers were a fair lot; Mr. Montgomery's second prize, only 2 years and 4 months old, was forward in calf, with rare promise for milk, being, to my mind, preferable to the Stand Stud Company's winning heifer, with dangerous-looking horns. The former cannot fail to grow into a first-class Show cow.

Kerry Cattle.

This breed, though compressed into two classes, one for males and one for females, mustered in tolerable force; indeed, the cows

and heifers were a numerous lot. Bulls, varying in age from 15 months to over 6 years, and therefore not easily compared, were headed by Mr. J. Robertson's "Busaco," from Co. Dublin, a bull of great depth in front, with well-sprung ribs, but slightly deficient behind. The second place was very deservedly awarded to Mr. Hogg's "Punch" (he might well have been named "Tom Thumb"), from Sussex, a pert but compact little fellow, just 37 inches high at the shoulder, but losing none of his height or importance for lack of conceit! The third prize was awarded to the Earl of Clonmel for a thick good specimen; while No. 1612, owned by Sir Richard Wallace, Bart., fairly earned the "reserve" ticket. Mr. Richard Good, of Co. Cork, had a nice lengthy bull, a frequent winner at the Cork and Dublin Shows, but not placed here.

A few particulars respecting these hardy, symmetrical little animals, so strongly resembling the Bretons in colour and general outline, may not be devoid of interest. Whilst I was taking notes upon them one day, Mr. Cogan, of Bishop's Court, Co. Kildare, overhearing my remark, "It won't take much grass to satisfy these wee things," at once attracted my attention by saying, "Excuse me, but those animals live where there is no grass"! This sounded so odd that I naturally inquired, "Pray, then, what do they live upon?" "On heather," was the prompt reply. Thereupon Mr. Cogan gave me, in substance, the following interesting notes. "These little creatures are reared chiefly by small landholders, and at a very early age are turned, without house or shelter of any kind, upon the mountains of their native county, the same as you do sheep on your Cumberland hills, where they shift for themselves as best they can until they are about two years old. They are then collected, sorted, and sold to dealers, who again dispose of them to the farmers in Connaught and other arable districts, who eventually stall-feed them on turnips, hay, oilcake, &c., making them, at four years old, weigh from 5 to 6 cwt. of prime beef. My own experience of the breed is that, with tolerably liberal treatment, they can be brought to 5 cwt. at three years old.

"Now as to their good qualities. There is, first, hardiness of constitution. Rarely, indeed, is one lost from pleuro-pneumonia or any of the other diseases that cattle are subject to. Secondly, you can feed five of them on the same quantity of food which three animals of any of the larger breeds would consume at the same age. Thirdly, when fat, they will fetch a halfpenny per pound-weight more in the market than any other breed of cattle. And, fourthly, they only require a small amount of capital to purchase them. I may add, moreover, that Kerry is a dairy county, producing, annually, large quantities of butter, which has a high character in

the market; so that these active little creatures are as useful for dairy as for fattening purposes. Their native mountains range in height from 400 to 3000 feet above the sea-level. The principal herbage is heather, gorse, and ferns; but, being far to the south, and bounded by the sea, the climate is very mild. You will quite understand that in-breeding, and being mothers at an early age, keep the animals stunted in size. It is much to be regretted that those who breed them are not more careful in the selection of bulls, as, if they were, the value of the produce would soon be enhanced 20 per cent."

Dairy Cattle.

These were divided into two classes; the one being pairs of cows of any breed, in-milk, and from the same herd; the other for single cows; the all-important condition in each case being "milking properties to be specially considered." Instituted some ten or twelve years ago, these prizes for dairy cattle proper have so far been productive of immense good; and it would be well if the Council could see their way to offer still greater inducements to exhibitors by in some measure separating the breeds. I say, most emphatically, that it is the duty of landowners and farmers alike, both collectively and individually, to aid by every possible means in restoring to several of our otherwise faultless breeds of cattle those milk-giving qualities which they have been, and are still, in danger of losing, and which are not of individual but of national importance. Pure milk, of average quality, contains, in a readily assimilable form, all the elements required to build up the human frame; so that, to the young more especially, the value of pure wholesome milk is incalculable; while I have myself seen those who were on the verge of the grave saved by its judicious and timely use. Few, indeed, are the "cases" in which the doctor forbids it—innumerable the times when he relies mainly on its life-saving properties. The most skilful compounder of so-called "foods," can only imitate it, while the chemist gives it up in despair. True it is that, owing to the generally short supply of this valuable animal-product, milk, as sold in large towns, is, or rather has been, considerably diluted with water. I say "has been," because there can be no doubt that since the passing of that much-needed Adulteration Act, milk has been sold in a much purer state than formerly. And it is this very Act which has caused the greatly increased consumption of the article in question; hence, what with a growing demand, and a population increasing daily, it becomes more and more manifest that the milk question is one presenting no ordinary difficulties.

Begging pardon for having made this digression on a favourite theme, I will now turn to Class 137, *Pairs of Dairy-Cows*. The total number of entries was 14, and of these, 4 pairs were described as Ayrshires, and the remainder as Shorthorns, more or less crossed. The prize pair, bred and exhibited by Mr. Harvey, of Gloucester, were evidently pure Shorthorns, with grand bags, and carrying a good deal of flesh. These are the sort that pedigree and non-pedigree men alike ought to aim at breeding, for, when they have fulfilled their mission as breeders and milkers, they will feed quickly and economically, and, above all, when slaughtered, they will give satisfaction in the scale. The second prize was very justly awarded to a pair of fine, massive, well-fleshed cows, sent by Messrs. Welford and Son, who are extensive London dairymen. Much credit is due to these gentlemen for their selection; and had it not been for a defect in the udder of one of the cows, their pair would have been placed first. The Stand Stud Company took a well-deserved third, with a pair of heavy milkers; one a blue-grey, horned, and the other a cross-bred, with Shorthorn marks. I may also mention very favourably in this Class, as showing how easily milking and beef-yielding properties may be combined, the "reserve" pair of Mr. W. P. Warner; the commended of Mr. F. Tallant; and the two exhibits, Nos. 1644 and 1645, of Mr. John Denchfield, of Aylesbury. The Stand Stud Company, too, deserved very great credit for their two pairs of Ayrshire cows, Nos. 1649 and 1650, both highly commended by the Judges.

Class 138, *Single Dairy-Cows*, contained some excellent milking sorts. The Stand Stud Company took first, with "Buttercup," of the Yorkshire breed; though not a few outsiders would, under the conditions, have preferred Mr. George Ferme's third, a cow with a perfect bag, but evidently milking herself terribly down. This was the best Ayrshire on the ground, and might well have been shown in Class 119. Mr. T. Kingsley's second prize, evidently a cross between Shorthorn and Ayrshire, was a thorough combination of the deep-milker, great flesh-carrier, and good weigher, though her udder was not of the best form. The highly commended and reserve number of Mr. Bliss was also a cow displaying an extraordinary bag, and plenty of good flesh. Messrs. J. Welford and Son, who stood second in pairs of Dairy-cows, had several highly meritorious entries of single cows, notably their Nos. 1670, 1671, and 1672. Mr. R. E. Lofft's Suffolk cow, showing more disposition to milk than the breed generally get credit for, was highly deserving her commended ticket.

Below will be found the Report furnished me by the Judges of Ayrshires, Kerries, and Dairy-Cattle:—

Ayrshires.—In Class 117 there were four entries, and one very fine animal.

Class 118. The two prize bulls had the type and character of the pure Ayrshire.

Class 119, *for Cows in-Milk*, was a very fine class; the udders and general style of the three prize cows were first-rate.

Class 120 was also good, but not quite equal to the class for cows. No. 1575, which was placed second, might have been first had she been in-milk, with a fully developed udder.

The Judges awarded the prizes to those animals which, in addition to their other merits, possessed the best Ayrshire type.

Kerry Cattle.—Class 133 contained a grand old bull and a promising youngster.

Class 134. The entries were large and good. A diversity of character was observable. Some of the animals were not true Kerries, but of the "Dexter" variety, a short-legged sort which is not suitable for mountain pasture but well adapted for grazing in a park. No prizes were awarded to these animals. The prize cows were very good, with fine udders; the reserve number would have been placed higher but for the shape of her bag.

Dairy Cattle.—Class 137. This was a fine class, and contained a number of the cows so highly esteemed by London dairymen. The Judges felt the usual difficulty in deciding upon the relative merits of *pairs* of animals of *different* breeds. The first-prize pair were fine Shorthorns with good udders. The second-prize pair had capital dairy looks, and were very even in character; but for a deficiency in the fore-quarter of the udder of one of them, they would probably have been placed first. Two pairs of Ayrshires with first-rate udders were highly commended.

Class 138, *for single Dairy Cows*, was also good. The first- and second-prize cows were good Shorthorns, the third an Ayrshire with a splendid udder.

A Suffolk Polled cow, showing great milking capability, and a Jersey were commended.

William T. Carrington.
Andrew Allen.
Luke Christy.

Polled Galloways.

There were only eleven entries of this breed, every animal gaining a prize or commendation; indeed, the quality of this section was superb. On viewing Mr. James Little's first- and second-prize Aged Bulls, one might well have exclaimed, "How happy could I be with either, were t'other dear charmer away!" They were, beyond question, a magnificent pair, standing on neat short legs, and covered all over with deep heavy flesh. Opinions were divided as to whether the winner had any advantage, beyond a trifle in size and weight, over his companion, which was bred by Mr. James Graham, of Longtown, Cumberland, a man universally known in connection with prize-winning Galloways, and whose fine cow, "Forest Queen 2nd," stood first at Kilburn, beating the two famous animals exhibited by Mr. Cunningham, another enterprising Galloway fancier. Of Yearling Bulls only two were shown, but they were fit to win in a full class. The winner, owned by Mr. Graham, of Beanlands

Park, near Carlisle, but bred by Mr. Graham, of Longtown, stood remarkably well on short clean legs; his ribs were also well let down, and well covered with lean flesh; while he possessed the additional merit of being in no more than everyday working condition. Barring a slight roughness at the setting-on of the tail, Mr. Cunningham's second was little inferior to his vanquisher, and he, too, was in no way over-fattened. Of Heifers, in-Calf or in-Milk, only four were presented, but they were all of true Galloway type, perfect specimens of the breed. His Royal Highness the Prince of Wales was awarded both first prize and the "reserve," the former for a Cumberland-bred heifer, doing great credit to the breeder—Mr. Murray, of Low Row, near Brampton. She was of remarkable length of body, had abundant hair, and a well-filled udder, and had a promising calf at foot. This was a sweet-looking heifer throughout. The second and third prizes went to Mr. Graham, of Longtown (already mentioned as breeder and owner of the first-prize cow, and of other winners), for two very neat heifers bred by himself. The former, though smaller than her companion, stood on remarkably short legs, and was singularly neat in the rump and hind-quarters. She had never, until now, been beaten in any Show-ring.

Polled Angus or Aberdeen.

This breed, so long famous for its beef-yielding properties and lightness of offal, is perhaps the best of all the Scotch varieties, and it has deservedly risen in the estimation both of Scotchmen and Englishmen since that world-renowned cultivator of the sort carried off the "*Grand Prix*" at Paris, last year, with a group drawn from his magnificent herd. It was a source of unqualified regret that the Tillyfour herd was not represented at this great international gathering, because, to Englishmen and foreigners alike, Mr. M'Combie's specimens would have been fraught with interest. However, notwithstanding this drawback, there were some highly meritorious examples of the breed shown. In Aged Bulls, a class which the Judges pronounced "truly magnificent," the pride of place was given to Sir G. Macpherson Grant, Bart., for "Young Viscount," aged 6 years, and bred by Mr. W. Duff, from Aberdeenshire. This bull, though slightly abdominous, carried a majestic head and crest, broad forearm, and wide prominent bosom. His legs, too, were short, and his bone was remarkably fine. Some thought him a trifle round in his hind-quarters, but this was, I think, caused by the singularly massive development of his enormous rounds and heavily fleshed thighs. Extraordinary strength in one point will, I hold, often cause an adjacent part, not really

wanting, to appear weak and defective. The second ticket was deservedly taken by the Marquis of Huntly's "Monarch," having a back like a dining-table, and a more than creditable son of his Lordship's first-prize cow, "Madge." This was a bull of wonderfully heavy good flesh, deep ribs, and body to the ground. The third-prize, highly commended, and commended animals in this class also showed very superior merit. Of Yearling Bulls there were only three, the first being owned by the Earl of Strathmore, very big for his age, and never previously exhibited. A slight deficiency through his heart was noticeable, but his loins are large, his chine is broad, and his flesh heavy. Mr. George Bruce's second prize was also well-fleshed and well-haired, crops and loins capital; but he drooped a trifle behind. Cows were an uncommonly good class of seven entries, the best being sent by the Marquis of Huntly, and she, having a calf at foot (and a grand one), refused my proffered caresses. She looked, however, a large fine cow, with long and well-filled hind-quarters, and mellow touch. Mr. J. A. Bridges' second-prize cow, though neat enough, was smaller than the Marquis's, and her calf was poor and thin-looking. This same gentleman also took third ticket; while the "reserve" went to Sir George Macpherson Grant, Bart., for a massive good cow, with bountiful udder, mellow touch, but inclined to patchiness behind. The Marquis of Huntly was the only exhibitor in the Two-year-old Heifer Class, and his "Princess Royal," though evidently suffering from a crushed knee, could have held her own in a class of more than ordinary numbers and quality.

West Highlanders.

This active, hardy, shaggy-coated race, admired alike for the picturesque beauty which they lend to the park of the nobleman, and for the richly flavoured, tender beef which they give to his table, cut but a sorry figure at Kilburn. Four classes open to them only drew three entries, Bulls; and all sent by Mr. Duncan, of Benmore, Argyleshire, who was an exhibitor of this breed at Paris last year. His five-year-old bull, though carrying a good head, ample horn, and lengthy carcass, was hardly a Royal winner; while his younger pair, both bred by the exhibitor, were not such as I hope to see at Carlisle next year.

A further, and that a very interesting, exhaustive description of the Scotch breeds will be gathered from the accompanying Report of the three gentlemen who adjudicated upon them. Moreover, their remarks possess additional value through being endorsed by Mr. J. D. Dent (one of the Society's Trustees), who aided them in their arduous task.

Report of the Judges on the Polled Angus, Galloway, and West Highland Cattle.

The Judges report that in their opinion these three hardy breeds of cattle have, although not very numerously, on the whole been very creditably represented on this occasion. Of the classes submitted to them the most numerously represented were the Anguses, a thoroughly useful breed, they think; indeed, one which is unsurpassed by any other. A prejudice seems at one time to a certain extent to have existed regarding the *Angus*, on account, as it was said, of animals of this breed not arriving so soon at maturity as did certain other contemporary breeds of heavy cattle. This prejudice, however (for it never was anything else), is rapidly disappearing, and there is little doubt (the Judges think) that at no distant date this breed will be the representative national breed of Scotland. The young stock of this breed shown on the present occasion are, the Judges submit, in themselves a sufficient refutation of the *quondam* charge of tardy maturing, for they will compare very favourably with the *Shorthorn*, or any other breed of cattle in the Show, of the same age. It is satisfactory therefore to know that in its native Scotland the valuable *Polled Angus* is at present in the ascendant, and very rapidly gaining ground; and that it is yearly going into more hands and displacing other less-valuable or less-suitable breeds. Some time ago a Herd-book of the breed was started, which has been a great success and given a considerable impetus to *Polled Angus* cattle-breeding—and in its pages the genealogies of all the more noted herds are now recorded. This Herd-book is conducted by Mr. Alexander Ramsay, of Banff, N.B.; and the fact that in the last volume issued in 1879 the number of owners and breeders contributing to the Herd-book was augmented by forty-four over the number contributing to the previous volume issued in 1877, is sufficient proof that Mr. Ramsay does his work well, and has the confidence of breeders. It is also a proof that the breed is more and more taking its place as the appropriate national breed of the turnip-growing districts of Scotland. Reporting, as they are, to the Royal Agricultural Society of England, the Judges think it right simply to mention, that to the late Mr. Hugh Watson, of Keillor, near Coupar Angus, Forfarshire, the credit of Polled Angus cattle being what they now are is most justly due. Previous to the time of his memorable improvements on the breed, which commenced at Keillor in 1808, Polled Angus cattle were very different in appearance from what they now are; and from his herd all the improved *Angus* cattle have been more or less derived. The nearer in affinity Angus cattle are to the Keillor herd, the more valuable they are; and the Judges trust that this passing tribute to the memory of a distinguished Scotch agriculturist may not be deemed inopportune on their part; believing, as they do, that the influence exerted by such men on the material prosperity of their country is such as can hardly be over-estimated.

In the Class of Angus Bulls over Two-years-old, seven entries were put before the Judges, five of which were excellent animals of the breed. The bull to which the first prize was awarded is an admirable specimen, although on account of his age, six years, somewhat *paunchy*. Judging from his appearance, this bull should weigh over 24 cwt. His deep broad body, on short legs, levelness, straightness of line along the back, neatness of shoulder, characteristic neck and head and great substance, have long been distinguishing characteristics of the better specimens of the Polled Angus breed. The same may be said of the second-prize bull as to straightness and good lines, and indeed he is sweeter about the head and neck than the first-prize bull, although wanting in the great substance of the latter. Leaving out the first- and second-prize bulls in this class, either of the three bulls

next in order to them would have made very creditable firsts at any national Show.

In the class of Angus Bulls under Two Years old, only fair representatives appeared. In order of merit they were considerably behind the older bulls.

The cow to which the first prize was awarded had strength, quality, and substance rarely to be met with in cows of any breed; whilst those to which the second and third prizes were given were nice level animals. The commended cow in this class, a great, strong, fleshy animal, although a fine Angus cow, the Judges considered would have been more in her proper place at a show of fat stock. The Angus Heifer under Three Years old was perhaps the sweetest animal in the Angus cattle classes. In every point she upheld the good character of the breed, and was in fact a formidable opponent to the first-prize Aged Bull in competition for the Champion cup.

Of the three breeds adjudicated upon, the Galloways came next to the Anguses in point of numbers; and although the show of Galloways was numerically small, some of the best specimens of the breed which have ever been exhibited were sent. For the northern counties of England and south-western counties of Scotland no other breed in point of suitability approaches the very handsome Polled Galloways, and they are right good feeders and thrive in nearly all climates. In the district mentioned, the Galloways at one time held almost undisputed sway; and although the great demand for, and high price of, dairy produce some years ago allowed the Ayrshire breed to gain a footing within the stronghold of the ancient Galloway, now that the cry is more for *beef* than for butter and cheese, the Galloways are again very rapidly gaining their former position as the one appropriate breed of the south-west of Scotland and north of England. The first-prize Galloway Bull over Two Years old was a remarkably fine animal: the second-prize animal was also a good one, but considerably behind the first. The Yearling Bulls were very nice animals, and very well brought out, reflecting much credit on their exhibitors. The Galloway Cows and Heifers were both grand classes, the first-prize Two-year-old Heifer being specially noteworthy, and the Judges are now pleased to learn that this fine animal is from Sandringham, and the property of H.R.H. the Prince of Wales, K.G.

The fitting representatives of a country of high mountains and rough-grown heaths, the shaggy *West Highlanders*, with a freedom of motion so foreign to the more pampered breeds, were, as could only have been expected, limited in numbers. Those shown, however, combine the graceful form and majestic gait and movement, which are such strongly marked features of the genuine *West Highlander*. The aged West Highland Bull shown, with his finely arched ribs and level back, and his deep and well-formed chest and splendid horn, was doubtless an object of admiration to those visiting the Show who love to see a fine specimen of a West Highlander direct from his "native heath" in his natural condition.

The Judges wish here to specially remark they were sorry to learn, subsequently to finishing their duties, that, through some mistake, the commended ticket in the Class of Aged Angus Bulls, Class 125, was given to a bull "Nicholas"—Catalogue No. 1590—with long scurs; instead of to another bull, "Logie the Laird 3rd,"—Catalogue No. 1586—as they intended.

In concluding their Report on the *Angus*, *Galloway*, and *West Highland* cattle, the Judges, as representing the breeders of those cattle, beg to take this opportunity of thanking the Council of the Royal Agricultural Society for having afforded breeders such an opportunity for the representation of their stock at this, the largest Agricultural Exhibition ever held.

THOMAS FERGUSON.
THOMAS GIBBONS.
DANIEL MCDIARMID.

Having accompanied the Judges during their work, I feel that I can confirm their Report as to the excellence of the Scotch cattle exhibited. It showed no little pluck in our North-country friends sending their animals such a distance under very discouraging influences of weather. At Carlisle we may expect to see the Galloway and Angus cattle more numerously exhibited, and I should strongly advise that at that Show there should be Classes for Aged Bulls over Three-years-old, and also for Bulls not exceeding Three-years-old, and Bulls not exceeding Two-years-old.

JOHN DENT DENT.

FOREIGN CATTLE.

Those visitors to Kilburn whose main object was to see and admire the Foreign Cattle must indeed have turned away wofully disappointed; that is, if they estimated them according to our English views of what constitutes a good beast. Arrived at the Showyard, they found, probably for the first time, that for wise and obvious reasons sheds for the reception of the foreign animals had been provided at an extreme corner of the enclosure, as far removed as possible from the British Section. Moreover, on reaching this spot, visitors found that, notwithstanding the liberal sum (over 2000*l.*) offered by the Mansion House Committee, and which was spread over no fewer than fifty-six classes, many of the most picturesque and most interesting breeds were totally unrepresented. In fact, this remark applies to eight of the fourteen varieties or breeds invited, a condition of things attributable partly to the inconvenience arising from the necessary quarantine at the port of debarkation, but still more to a dread of the serious delay and probable loss that must have arisen had there been any outbreak of disease in the Showyard.

Foreign-bred Shorthorns stood first on the list, and here there was only one entry, a very useful-looking, level-made bull, with well-placed shoulders, mellow touch, and good flesh. He was sent from Denmark, but no particulars of his breeding were furnished by the Catalogue. The remainder of the Shorthorn divisions, as also those for Charolais, Garonnais, Limousin—all French breeds—were totally void of entries. The four classes of Normans, however, contained together fifteen entries, the two Aged Bulls being massive and fairly fleshed, but wanting in quality, apparently docile, and not over-fed. The first-prize Yearling Bull had a better and thicker middle than most of the specimens; but he drooped behind, and was too strong in the hair, which generally indicates a slow feeder. The second prize was a plain but growthy youngster of twenty months; fish-backed, and rough in the shoulders. The winning Norman cow was neat in front, well-filled behind the shoulder, with good twist, but plain, drooping quarters, and showing that singularly-broad heavy muzzle which seems to belong to

the breed. Second and third prizes both went to Mons. Hector le Sueur, of Port-en-Bessin (who, by the way, owned both the first-prize bulls just mentioned), the former being awarded to an animal scarcely inferior to the winner. The best of the Norman females was undoubtedly Mons. Céran Maillard's heifer, twenty-two months old, which secured first honours; another, sent by the same breeder, taking the reserve. Second and third again went to Mons. Hector le Sueur, for "La Barbette" and "Blondine," the former of which had the backbone well-developed!

Of Bretons, a diminutive but symmetrically-made breed, closely resembling the Kerries, there were only eight entries in the four classes. The sole representative in Bulls over Two-years-old was "Jobie," bred in France, but exhibited by Mr. Albert Dixon, of Windsor. This was a thickly made compact little fellow, with famous crops and loins, deep ribs, prominent rounds, broad chine, and small bone, his great fault being the too high setting-on of the tail, characteristic of the breed. "Little John," the only Yearling Bull sent, had wonderfully big forequarters for one so young, being only 17½ months old. Mr. Albert Dixon, already mentioned, swept off all the prizes for Breton cows with three pretty little well-proportioned creatures, the *premier* one having the reputation of yielding 10 quarts per day of rich milk. Her bag, which was well-formed, looked equal to the quantity, and more. Mr. Ladwick's "Polly," though not allowed a prize, was a true specimen of the Breton. In the Heifer Class there were only two entries, both belonging to Mr. H. B. Spurgin, of Northampton; "Lady Jane," the winner, though only two years and six months old, being in full milk, and displaying a right good bag.

Of "Dutch and Flemish" there was only one solitary example, "Prins" by name, sired by "Symen," who had the credit of being entered in the 'Dutch Herd-book.' Moreover, he was no despisable beast, having a good thick back, capital loins, and stood straight behind; his pelt was, however, too heavy, and he was a little high above ground.

The following is the Report of the Judges who acted in the foregoing Foreign Classes:—

The Judges in Classes Nos. 264 to 279 inclusive, beg to report their regret that so small a number of cattle competed for the very handsome prizes offered by the Mansion House Committee, in the classes on which they had the honour of adjudicating. They are assured that a much larger number would have competed, had it not been for the dread of the quarantine regulations. There were several animals of considerable merit in the Milking Classes, and the only competitor in the Foreign Shorthorn Class was a fair specimen of the breed.

John Kensley Fowler.
J. L. de Felcourt.
William Stratton.

Passing over the Swiss, Spanish, and Portuguese Classes, which held no entries, I come to the Angelns, a breed displaying a great length of outline, with a curious, plentiful development of useless skin along the under-side of the neck; their weak point being a too general lowness of the back. The first-prize Aged Bull, "Garibaldi 2nd," carried a fine masculine head and well-arched crest, with broad loins and crops; while the second, though long drawn, was low in the back, and somewhat flat-ribbed. The third, though deep in the ribs, was beaten on account of his rough shoulders. The best of the bulls was the winning Yearling, which was well-topped, and much neater about the rumps than the older males. In Cows I thought the first and second prizes might have been reversed. Perhaps the Judges did not make allowance for the thin condition and evident deep-milking qualities of the latter, whose excellent bag and docile expression were very taking. This brings me to the Jutlanders, a breed closely resembling our Ayrshires, and undoubtedly the best of the foreign cattle at Kilburn. A very competent authority informed me that 300 to 400 head of them are landed at Deptford weekly, averaging 100 to 120 stones a-piece (8 lbs. to the stone), and are well thought of by the butchers. Barring an evident tendency to be abdominous and flat-sided, these are useful cattle; their mellow touch, fine bone, short legs, and (in the cows) their abundant udders, being valuable points in any breed. The first- and third-prize Aged Bulls were exhibited by Johannes Ingwersen, of Hegnet, Jutland. The former was a very fair beast, having good crops and loins, deep sides, heavy flank, long quarters, capital twist, and tail better placed than is commonly the case in this breed. The second prize was given to Mr. A. W. Knuth, for "No. 1," a black-and-white bull, with the paunchy flat-sided form already complained of, but showing deep ribs, massive frame, and plain rumps. The "reserve" might, to my mind, have been placed higher. He displayed a well-covered back, deep ribs, lengthy quarters, thick massive thighs, well-fleshed to the very hock; but he, too, was pot-bellied, and rough about the shoulders. The first-prize Yearling Bull, with large loins, ribs a trifle flat, and ill-fitting tail, bore a marked resemblance to a moderate Ayrshire. In Cows the first ticket went to P. C. Jensen for a very pretty specimen, just being photographed as I passed. She was of mellow touch and deep-sided, with a tendency to flatness in the sides. The second cow had much to recommend her, a bountiful udder being not the least of her attractions. Jutland Heifers, in-Calf or in-Milk, were five in number, but they did not seem to require special mention.

The Judges of Angeln and Jutland breeds kindly furnished me with the following very capital Report :—

ANGELN.

CLASS 284. *Bulls above Two Years old.*—Three animals exhibited, generally with good points and good size. Prizes were awarded to each.

CLASS 285. *Bull not exceeding Two Years old.*—Two exhibited, to one of which (No. 2818) the first prize was awarded; the other was of inferior quality, and received no award.

CLASS 286. *Cows above Three Years old.*—Four exhibited, all good specimens of the breed, showing good points and good milking qualities. Prizes were awarded to Nos. 2821, 2820, and 2823; and the reserve number given to No. 2822.

CLASS 287. *Heifers not exceeding Three Years old.*—Four exhibited, all good, with excellent points, good size, and good condition. The first prize was awarded to a particularly good and well-grown animal (No. 2827), the second and third prizes to Nos. 2824 and 2825 respectively, and the reserve number to 2826.

JUTLAND.

CLASS 280. *Bulls above Two Years old.*—Six exhibited; heavy well-grown animals, with good meat-producing characters; fair specimens of the breed. The prizes were awarded to Nos. 2829, 2832, and 2830, respectively. No. 2828 was the reserve.

CLASS 289. *Bulls not exceeding Two Years old.*—Two exhibited. The first prize was awarded to No. 2834, a well-grown animal, with good size and good points. The other was withdrawn.

CLASS 290. *Cows above Three Years old.*—Six exhibited, all of good size, showing meat-producing rather than milk-producing qualities. The prizes were awarded to Nos. 2837, 2839, and 2841, respectively. No. 2840 was the reserve.

CLASS 291. *Heifers not exceeding Three Years old.*—Five exhibited. A very good lot, in which the characteristics of the breed were well marked, especially in No. 2846, to which the first prize was awarded. Nos. 2842 and 2844 received the second and third prizes.

The Judges regret that these two important breeds should have been so sparingly represented on the present important occasion.

The Angeln breed is the best dairying breed in Denmark, and furnishes a large proportion of the butter produce which now forms so important an article of export from that country to Great Britain; while the stock-markets of this country testify to the increasing demand that exists for the meat-producing breeds of Schleswig and of Jutland.

CHRISTOPHER BREINHOLT.
JOHANNES FRIES.
JOHN WILSON.

The classes for Schleswig-Holstein cattle, and for "other Foreign Breeds," alike for "meat-producing" as for "milking purposes," were unfortunately totally devoid of entries.

This brings my Report of the Cattle Classes at Kilburn to a somewhat abrupt termination; and I feel that I cannot close it without tendering to the Secretary, Mr. Jenkins, and to the several Judges and Stewards of Live-stock, my warmest thanks for their willingness to give me information in their respective departments whenever I had occasion to seek it.

XXIV.—*Report on the Exhibition of British and Foreign Sheep, Goats, and Pigs, at Kilburn.* By William Housman.

British Sheep.

As men advancing in years begin to perceive that summers are not so sunny, roses so sweet, nor stiles, to those whose shadows do not grow less, made so wide as "when we were boys," the unfavourable comparison of the present with the past is sometimes extended to their flocks and herds—at least to other men's flocks and herds. There is a widely prevailing notion that all cultivated breeds must see their best days and then necessarily decline, and it is not uncommonly harboured in forgetfulness of what "a breed" is and what it is not; in forgetfulness, too, of the marvellous extensiveness of man's "dominion over every living thing that moveth upon the earth." Of this dominion we have examples in the man who, drawing with a piece of chalk his ideal form of a sheep, said, "I'll breed up to that," and did it; and in the breeders who year after year exhibit at "the Royal" well-matched pens of model sheep, some of breeds unknown fifty years ago, from flocks at home as even as the proverbial peas in a pod. Many admirable illustrations may be borrowed from the recent exhibition at Kilburn, as I think we shall see in reviewing the classes severally, with the valuable assistance of the Judges' comments.

British Sheep, to which 75 classes were assigned, had entries (in some classes very numerous) in all but four. In the 71 classes the entries were 760, and as the ewes and ewe lambs were of course exhibited in pens of five, numbering 191 entries, the rams in single entries numbering 569, the total number of animals entered was 1512. Mr. Whitehead, the Steward of stock for the Sheep Department, reports the absence of 77 pens, representing 140 animals, so that the number of British sheep and lambs actually on the show-ground was 1372. Of these, I regret to notice, 18 rams, 4 pens of ewes, and 7 pens of lambs—in some cases whole classes—were disqualified by the Inspectors of Shearing, who thus report upon their unpleasant, yet, as it unhappily appears, most necessary labours:—

> As Inspectors of Sheep-shearing we have to report that after a very careful examination of the stock, we found very many sheep in the Show-yard not fairly and honestly shorn; and after giving some numbers of sheep the benefit of a doubt, we then recommended the numbers as given to the Council to be disqualified. These showed in some cases most glaring infringement of the rules as laid down for our guidance. We have to remark that some of the Border Leicester, Roscommon (Irish) sheep, and other classes gave us much consideration whether or not to recommend the disqualification of other numbers besides those given. Two or three years ago we found a great improvement

generally in the shearing of the sheep, and we regret much to report that instead of further improvement in this respect, many exhibitors are trying to fill up with wool where the natural shape and mutton are deficient, and we wish to express our dissatisfaction that the Rules of the Society are not strictly adhered to.

This year also the dressing of lambs was carried out by exhibitors, and according to our instructions we recommended the disqualification in every case, including the best lambs in the yard.

Two of your inspectors here have acted for many years, and we regret to say that from the earliest years of our attendance in the Royal show-yard, we have found this to be one of the worst for dressing and false shearing. We trust, however, that from the numbers you have disqualified on our recommendation—and in each case we are prepared to stand on our decision—exhibitors in future will be more careful as to the shearing and dressing of sheep.

William Jobson.
J. B. Workman.
James E. Rawlence.

The first breed in the order of the Catalogue—the Leicester—fitly placed in the van of modern improved breeds, and deserving precedence likewise for its incalculable usefulness as the improver of many other breeds, and one of the most potent of factors in food-production by cross-breeding, was generally considered to be creditably represented, notwithstanding the shortcomings with regard to wool of several otherwise fine rams. The somewhat chilling tone, however, of the Judges' Report, must temper the eulogiums of critics less competent than the appointed arbitrators to speak authoritatively. The following are the passages referring to the Leicester classes in the Report of Messrs. Casswell, Sanday, and Paddison, upon the Lincoln and Leicester sheep :—

Class 139. *Shearling Rams.*—Class generally uneven, both as regards form and wool, the mutton and backs showing a deficiency, the first-prize sheep showing more combination of the old Leicester form, with the exception of his wool.

Class 140. *Aged Rams.*—Not a good class, some of the best formed sheep being deficient in wool.

Class 141. *Ewes.*—A fairly good class.

Class 142. *Ewe Lambs.*—This class only moderate.

With these brief remarks the Leicesters are dismissed by the Judges, who are evidently, and no doubt healthily, chary of praise for anything but the highest degree of merit. Still, looking along the pens of Leicester ewes and rams (the lambs may be omitted as unquestionably a weak class), and supplementing the evidence of the eye by that of the hand, one could not feel much ashamed of these very moderate classes, nor fail to own that they prove great results to have been accomplished by the skill of our stock-breeders. The principal contest in both classes of rams was between the entries of Mr. Borton and Mr. Hutchinson, one of the former winning the first, and one of

the latter the second prize, in the shearling class (30 entries, 4 absent), while the precedence was reversed in the class for older rams (19 entries, 3 absent), and in both classes Mr. George Turner, jun., showed the third prize sheep, winning also second to the executors of Mr. Francis Jordan for a good pen of ewes in a class of 9 entries, only one of which was absent. In a class of only 4 entries, Mr. George Turner's lambs, scarcely fair representatives of the produce of the Thorpelands flock (the season has been bad for lambs), were placed second to those of Messrs. Green and Son, exhibitors of the only pen which competed with his three pens. It was, perhaps, the loss of true Leicester character rather than faultiness of the animals, irrespective of breed, that detracted from the excellence of the Leicester classes. Looked at simply as *sheep*, from a rent-paying point of view, there were plenty of rams good enough to make a tenant-farmer's mouth water; while judged as *Leicesters*, with a certain well-defined standard in the mind's eye, many of the same sheep were found wanting. As some connoisseur parted the wool, a shake of the head, if indeed the word "Lincoln" were not distinctly uttered, indicated the tenour of his thoughts. Mr. Borton's flock, deep in "Sir Tatton" and "Blair Athol" blood, latterly crossed with carefully selected rams from Mr. F. Spencer's and Mr. S. Spencer's flocks, had a noticeable representative in the first-prize shearling ram, a good thick, "upstanding" sheep, with great legs of mutton, and deep-fleshed throughout; but his wool was the subject of comment in the Judges' Report, as given above; and Mr. Hutchinson's shearlings, with plenty of size, good loins, and amply expanded frames, showed much of the influence of their well-known sire, "Royal Liverpool." His two-shear ram, as already noticed, took leading honours in the aged class, "Royal Liverpool" being absent.

The Border Leicesters numbered 29 entries — 14 from Northumberland, 11 from Yorkshire, and 4 only from the Scottish side of the Tweed; all the latter from Roxburghshire, and belonging to one exhibitor, Mr. Thompson of Kelso. The inspectors of shearing had duties as difficult as they were unpleasant to perform, and were constantly hitting, like the cat-o'-nine-tails, either too high or too low. It was said that in the Leicester classes they had erred on the side of mercy, in those of Border Leicesters on the other side; so they may be congratulated, if not on having given satisfaction to all parties, at least on having incurred opposite charges, a fact somewhat consolatory to conscientious men who have done a painful duty. Border Leicesters made certainly a small show, but the merit of the animals throughout the classes amply compensated for shortcomings in number. Mr. Richard Tweedie,

of The Forest, Catterick, Yorkshire, showed four remarkably fine shearling rams and three two-shear rams, winning first and second prizes in both classes; but one of his best, if not his very best, sheep, the two-shear "Royal Stuart," and one of his shearlings, were disqualified by the inspectors of shearing. These, and his two pens of ewes (first prize and reserve), and one pen of lambs (third prize), were really such a lot as it is not easy to select from one flock in any one year. The shearlings and two of the two-shears are by "Royal James." The first prize shearling, wide through the heart, and of generous flesh-growth, and the first prize two-shear, "Royal Victor," were specially good specimens, and the prize ewes were also a very good even lot. Indeed, all the three pens of ewes from The Forest flock have the characteristic of similarity. Nearly the whole flock is bred from one foundation-dam, and home-bred sires have been used for many years. Of the fifteen ewes exhibited, seven were by "King James," four by "Royal James," and four by "Prince George," all well-known prize rams, in-bred from winners, whose live weight at the shows has been up to 33 st. and 34 st. of 14 lbs. Mr. Tweedie, however, had no easy winning, for Mr. Thompson's shearling ram (third prize), and pen of ewes (second prize), put in a very creditable appearance for the Baillicknowe flock, and his lambs were the best of all; and the entries of Mr. C. E. Hay, and those from Woodhorn Manor, did ample justice to the character of the Border Leicester in its English stronghold of Northumberland. Again it becomes necessary to divide the judicial report in consequence of the difference between the order of the show catalogue and that of the various classes assigned to each triumvirate. Messrs. Usher, Smith, and Rea, who awarded the prizes to the Border Leicester, Cheviot, and Roscommon sheep, write as follows:—

The Judges have to report a good exhibition of Border Leicesters. Although this breed was not so numerously represented, the merit of the classes generally was good.

The Cotswold classes comprised 52 entries, of which only 13 were from the native county of the breed—that of Gloucester. Oxfordshire contributed 27 and Norfolk 12. Single rams numbered 39, ewes and lambs, 13 pens of five; absent, 4 rams and 1 pen of ewes. The following general and brief Report is supplied by Messrs. A. Warde, B. C. Cobb, and R. Garne, the Judges of Cotswold, Kentish, and Devon Longwool sheep:—

Cotswold.—The entries in the classes were numerous, and well upheld the character of this excellent breed of sheep.

With the general unagricultural public, the Cotswold is

always a favourite, his rakish-looking forelock and the pure whiteness of his coat winning admiration. In the agricultural world, the breed has done great service. Since its admission to distinct classes at the International Show in Battersea Park, 1862, its course has been steadily upward; and although the Cotswold did not, like the Leicester in the days of Bakewell, take the world by storm, it is gradually and surely working its way; for it possesses that solid and undeniable merit which secures extensive if not the readiest recognition. Like the Leicester, it has proved an important agent in the composition of other breeds, and its ancient origin, great modern improvement, and distinctness of type, entitle it to a high place among our leading breeds. To say, as quoted above, that the classes uphold the character of the breed, is to give much praise in few words, for the Cotswold has a high character to uphold. In anything like ordinary classes, the sheep from the Royal Agricultural College Farm must have come to the front. They were, as usual, highly creditable to their breeder and exhibitor. In the shearling-ram class the well-known flocks of Messrs. Gillett, both of Oaklands and of Kilkenny (Oxfordshire), were strongly represented in number and quality, and one of a large contingent from the flock of Mr. T. Brown, of Marham Hall, Norfolk, received the first prize, while in the class for any other age, a splendid two-shear ram from the same flock—good either way, for mutton or for wool, with an attractive and sufficiently masculine look about him—was also first winner. The only other exhibitors besides those mentioned, in either of the ram classes, were Mr. J. J. Godwin, of Troy Farm (who got one commendation), and Mr. J. Corbett Hatherell, of Chippenham. In the classes for ewes and lambs, other names are in the first places, Mr. R. Jacobs, of Burford, being the exhibitor of the first prize ewes, a remarkably well-assorted lot, much alike, of beautiful character, and of that even well-knit form which detracts from the impression of size, but is favourable to great proportionate weight; and Mr. E. Tombs, of Bampton, showing the first prize lambs. Only half-a-dozen pens of lambs were exhibited, and they, very fairly for so unfavourable a season, did justice to the breed. In the older classes several animals had more or less of grey upon the face and legs, and this, so far as might be gathered by inference from the awards, was accounted in some measure to their disadvantage, although one case, that of Mr. John Gillett's third prize shearling ram, seemed to show that the objection, if considered as such, was a minor one in the eyes of the Judges.

Lincolns numbered 59 entries, 11 of which were absent. The same Judges, who are so sparing of commendation in

their Report upon the Leicester classes, write of the Lincolns, although briefly, in terms of very high praise, at least so far as concerns the rams.

Class 151. *Shearling Rams.*—A very good class, the first prize shearling showing great substance and quantity of wool.

Class 152. *Aged Rams.*—An extremely good class, showing great size, with quality and aptitude for fattening.

Class 153. *Shearling Ewes.*—Not a good class; the winning pen very good indeed.

Class 154.—*Ewe Lambs.*—Only a moderate class.

Tom Casswell.
Wm. Sanday.
Edwd. Paddison.

Although in their awards the Judges did not add many commendations to the money prizes, the foregoing remarks amount virtually to a general commendation of both classes of rams. The shearling class was a large one, containing 34 entries, 6 of which, however, were absent. The older class contained 15 entries, of which 3 were absent, and 2 disqualified. In both classes, Mr. Henry Smith, of the Grove, Crosswell Butler, exhibited the first prize sheep, and in the aged class the second winner also. His shearling ram, shown in full condition, apparently had not the easiest of victories; at least his winning first honours was by no means obviously the right conclusion. Mr. John Pears' fine wealthy sheep (second prize), and the excellent (third prize) ram exhibited by Mr. Wright, of Nocton Heath, were powerful rivals. These three clearly deserved the three prizes, although there were sheep perilously near them in merit; but to rightly place them first, second, and third, required very close and careful comparison, and considerable skill in estimating the value of different points of excellence in the different animals. It was no easy task. A very good and true-framed sheep of Mr. Arthur Garfit's had the reserved number; and there were two commendations, one for a companion ram to the first winner (Mr. Smith showing three in the class), the other to one of four good sheep exhibited by Mr. Torr, from the Aylesby Manor flock. Messrs. Dudding's four shearlings had the well-known high character of the Panton sheep, but wanted condition to prove their capabilities satisfactorily. Much is said, and with a great deal of truth, against forcing for shows; but, as is common in cases of reaction, the recoil from something excessive is more or less excessive in the opposite direction. All flesh-producing kinds of live stock, it should be borne in mind, when intended for exhibition, should have a sufficiently liberal training to develop their flesh-points, so as to afford the Judges a fair opportunity of estimating their worth; and does not this apply to the exhibition of breeding stock just

as truly as to fat-stock shows, however different may be the degree of condition necessary for the purpose? Value for breeding purposes, in stock of these kinds, must depend greatly upon what an animal is capable of being made. A good judge, of course, knows a good lean sheep; he can, to a certain extent, forecast its possible development, and is not to be deceived by the *embonpoint* of a bad one; but, granted a lot of good sheep in only store condition, surely it is unfair to the best of judges to demand of him, ignorant of each animal's power of digestion, an accurate guess which particular sheep can turn a given quantity of food into the largest and best distributed quantity of the finest mutton. This, however, is really demanded by those who make a great outcry for exhibition in "natural condition" —an ill-chosen term to apply to stock artificially improved. Messrs. Dudding had in the older class a really grand two-shear ram, shown just as a ram should be shown, in good but not excessive condition. This would have made a very creditable first winner, for he is a sheep of first-class merit; but it was impossible to pass over Mr. Smith's rams, two of which, named "Maréchal Bazaine" and "Lord Beaconsfield," were respectively placed first and second, with the general concurrence of competent judges among the bystanders. "Maréchal Bazaine" has that invaluable index of high breeding—a good head; is broad in the beam, and shows capital wool. None of Mr. Smith's older rams were, like his shearlings, home-bred. The fine two-shear just described, from the flock of the late Mr. W. F. Marshall, is quite of the Branston stamp. The second winner was bred by Mr. Thomas Mayfield of Boston. In the remaining classes of Lincolns, there was little worthy of note beyond Mr. Pears' first-prize ewes, which were very well matched, very good in the wool, and altogether very creditable to any exhibitor; all the more so, inasmuch as the exhibitor was also their breeder. Messrs. Dudding had the first prize for lambs; and in both ewe and lamb classes, Mr. Charles Sell showed the second, and Mr. R. C. Catling the third winners. The lambs were mostly of ample size, but looked rather weather-worn.

The Kentish or Romney Marsh classes had 34 entries, only one pen of ewes and one ram being absent. The extending colonial reputation of the Romney Marsh sheep, and the excellence to which they have attained in their own county, give them a high place among our improved breeds. It is therefore a source of regret that when the International Show was held so near their home, greater efforts were not made by the breeders to ensure their large and select representation. The following few words give the judicial summary of the classes at Kilburn:—

The entries were limited, and with two or three exceptions not up to the usual standard of this very useful breed of sheep.

The flock best represented was that of Mr. J. S. S. Godwin, of Hazelwood, Hadlow, whose sheep were not only of superior form and quality, but had also the finer sort of wool which too many of the competing animals wanted. All the prizes in the shearling ram class went to sheep of this flock, besides first prizes in the older ram and shearling ewe classes. Among the happy exceptions to the mediocrity of the classes were Mr. Henry Rigden's two-shear rams; and the best lambs were those of Mr. Page.

The next breed to which the order of the classes in the Catalogue brings me—the Oxfordshire Down—formed a very prominent feature of the show, in magnitude third on the list, the Southdown and Shropshire breeds only exceeding it, and the Hampshire immediately following it, in the number of animals entered. This excess was partly owing to the larger proportionate number of pens of ewes and lambs in the classes of these breeds. The Oxfordshire Down, for instance, had only 5 entries more than the Leicester, yet the number of animals entered was 53 in excess of the Leicesters. The following is the Report of the Judges :—

Class 159. *Shearling Rams.*—Contained thirty-five entries of very useful sheep. Although there is nothing of exceptional merit, we consider them a good class.

Class 160. *Aged Rams.*—Only five entries, four of which are particularly good.

Class 161. *Shearling Ewes.*—Thirteen pens, many of them very good. Most of the entries in this class received high commendations.

Class 162. *Ewe Lambs.*—Twelve entries. Several useful pens rather low in condition.

John Bryan.
James P. Case.

The Catalogue gives 37 entries of shearling rams, and the Steward reported three absentees. In the next two classes there was no difference between the Judges' figures and the numbers in the Catalogue; but three of the twelve pens of lambs were absent. Mr. Treadwell exhibited no fewer than ten in the shearling ram class, remarkably fine sheep, and won the first prize for an exceedingly true-shaped and level animal, with plenty of masculine character, a son of "The Swell," his second prize aged ram. Four of them were by the same sire, two by a sheep entitled "Earl of Beaconsfield," two by "Royal Liverpool," the third winner in the aged class, and one was, so far as the Catalogue entry is concerned, of unrecorded paternity. To meet such a lot required good material; yet one exhibitor, Mr. Brassey, of Heythrop Park, was able to carry second and

third honours; Mr. George Adams's good robust-looking sheep followed, having the reserved number and a high commendation; three of Mr. Treadwell's strong contingent were selected for high commendations, and one was simply commended. Of half-a-dozen sent by Mr. Charles Hobbs, four received commendatory notices, high or otherwise, and several of the sheep of Mr. Charles Howard and of Messrs. Frederick and George Street, were specially noticed by the Judges, and were, indeed, of a very useful stamp. There is notable evidence of the great amount of skill devoted to sheep-breeding, when so high an average of excellence is found in a class in which, as the Judges truly observe, "There is nothing of exceptional merit."

The four "particularly good" aged rams (*vide* the Judges' Report above) were Mr. Charles Hobbs's two-shear, a good sheep in capital condition, Mr. Treadwell's two, "The Swell" and "Royal Liverpool," and Messrs. J. and F. Howard's "Sir Charles," a four-year-old sheep, bred by Mr. Charles Howard. They won in the same order as here named, the last, an excellent sheep, whose width is evenly continued from end to end, having the reserved number and a high commendation, the three others the prizes. Mr. Treadwell's are both three-year-old sheep, and both by Mr. Milton Druce's "Freeland," who, first winner at the Philadelphia Show, was let to an American breeder, two years ago, for 85 guineas. "The Swell," a really grand sheep—large, wide through the heart, with an immense fore-flank—was a very close rival of Mr. Hobbs's first-prize ram; and "Royal Liverpool," who had his half-brother's form of fore-quarters, apparently of even greater proportion, from his being, at the time of show, somewhat "tucked up" in the paunch, was just good enough to come in before Messrs. Howard's "Sir Charles," already described. The four made their class a very attractive feature of its department of the Show.

Besides the three prizes and the reserve, seven high commendations and one commendation were awarded to the Oxfordshire Down ewes. Mr. Treadwell had here again first honours for a pen of closely matched ewes, with broad and evenly fleshed backs. They were by his prize rams, "Royal Liverpool" and "The Swell." He also showed two other pens, both highly commended. Mr. George Adams was very successful, exhibiting two pens, and gaining the second prize and reserve; and Mr. Albert Brassey (Heythrop Park) showed only one pen, which took the third prize. Messrs. J. and F. Howard, F. Street, G. Street, and C. Howard, were the exhibitors of the remaining pens distinguished by judicial notice, and described in the foregoing report as "very good." The lambs, although the

Judges remarked that they were rather low in condition, had a hardy, vigorous, weather-proof look about them; nothing of the scoured, washed-out appearance of so many of the lambs of other breeds, after the deluge of eight or nine weeks' duration, and they were certainly well grown. The Heythrop Park flock supplied the first winners, Mr. W. Arkell, jun., exhibiting a good second-prize pen; while Messrs. G. and F. Street, J. and F. Howard, and G. Adams, showed some useful pens.

The Southdown beat all the other breeds in point of number, having 103 single entries of rams, and 29 entries of ewes and lambs, in pens of five, representing 145 animals. All the ewes and lambs were on the Show-ground, but twelve of the rams were absent; so that the total number of Southdowns actually in the pens was 236. This was really a wonderful show, to which Messrs. E. Little, J. A. Hempson, and H. Overman, the Judges of Southdown, Hampshire, and other short-wool sheep, have done justice, and no more than justice, in the following Report:—

The Southdowns formed one of the grand features of the Show. The classes were well filled with exhibits from nearly all the principal flocks in the kingdom. As will be seen from the awards of the Judges, the prizes and commendations were distributed amongst a larger number of exhibitors than has for some years past been the case, which is a proof that a large number of superior sheep were entered. A short detailed report of each class is appended.

Class 163. *Shearling Rams.*—A very large entry, sixty-six. Very few were absent. Many of them, being splendid specimens of the breed, gave the Judges a considerable amount of work to make their award—there being five high commendations and six commendations in addition to the three prizes.

Class 164. *Aged Rams.*—In this class there were thirty-five sheep entered, and many of them were of great merit, in addition to those to which the prizes were awarded.

Class 165. This was probably the largest and best exhibition of shearling ewes ever since the foundation of the Society. There were twenty pens. The competition was so close that the Judges, after awarding the prizes and high commendations, felt it their duty to commend the class generally.

Class 166.—This is the first time that prizes have been offered for ewe lambs. There were nine entries in the class, but several were absent. One pen, No. 2113, was disqualified for being trimmed. As a rule, Southdown lambs four months old do not show well. The competition was not so good as might have been expected. The President, H.R.H. the Prince of Wales, took the first prize with a matching pen with good backs.

In each of the ram classes, the Catalogue gives one more entry than the Judges have accounted for. Besides the first prize for ewe lambs, prizes in each of the other classes were adjudged to representatives of the Sandringham flock, four prizes altogether, or one-third of the prizes offered. With this exception, exclusive of the reserved numbers, no flock had more than two winners or winning pens in the Southdown classes. Mr. Colman's two first prizes, for a two-shear ram and for a pen of shearling ewes, made the next highest score. Mr. Alfred Heasman showed the

second-prize ewes and ewe lambs, but no other exhibitor had more than one prize, a fact which accords with the remark in the introductory paragraph of the Judges' Report, concerning the large number of exhibitors among whom the honours were distributed. The entries of Lord Walsingham and Messrs. Rigden, H. Humphrey, and F. M. Jones, each took a single prize; and the very many exhibitors who have the credit attaching to the reserved numbers, high commendations, and commendations in these excellent classes, would make a list too long for insertion here. The number of prizes, of course, was limited to twelve, so that it was impossible to give to many sheep of very high merit any more substantial recognition than the card of commendation. Mr. Rigden's first-prize shearling ram has the beautifully moulded form of his breed, with rather more than ordinary length, and what is expressively termed "a bright look-out," that gaiety or smartness of style which high blood alone can give. Lord Walsingham's capital shearlings had the second prize and reserved number, divided by a Sandringham ram; and perhaps it is due to the Merton flock to say that the sire of the first-prize sheep was a well-known Merton ram. Messrs. J. and A. Heasman and H. Humphrey showed some very good sheep in the same class. In the older ram class, Mr. Colman's two-shear, a good model for shape, and very "ripe," well covered with flesh from head to tail, had powerful rivals in Mr. Henry Humphrey's ram (placed second), and a handsome three-shear, bred and exhibited by the Prince of Wales. Two excellent rams, shown by Mr. Hugh Gorringe, who also bred them, had the reserved number, a high commendation, and a commendation; and a strong force from Merton, one three-shear and four two-shear rams, of the stamp so well known, received only a couple of commendations; but as the Judges well observe, many of the sheep in this class, besides those to which the prizes were awarded, were of great merit. Indeed, had all the winners been absent, the class must still have been described as a good one, and the Kingston and Merton sheep would have been well worthy to receive the prizes. Perhaps in the whole Show there was not a more remarkable sight than the view over the 100 Southdown shearling ewes, brought close together in 20 pens of five—so large a number of animals, from so many flocks, yet so little varying in type. It was really a wonderful result of an incalculable amount of skilled labour, considering the processes of thoughtful selection, over a long course of years, necessary to give such uniformity as was here exemplified, in and among the numerous flocks of which the pens at Kilburn were representatives. Estimated according to an intelligent view of this class of sheep alone, the work of the stock-breeder, in its higher

departments at least, must command the respect which science claims. It is difficult to notice specially any of the pens without seeming to do injustice by the neglect of others good enough for special notice. The exhibitors were—His Royal Highness the President of the Society (two pens, one winning the third prize), Mr. F. M. Jones (reserve and highly commended), Lord Walsingham, Mr. H. Gorringe (two pens), the Duke of Richmond (two pens), Messrs. Emery (two pens), Messrs. Heasman (second prize), Col. Kingscote, Mr. G. Jones, Mr. C. Durham, Mr. C. Chapman (two pens), Lord Moreton, Sir N. W. Throckmorton (highly commended), Mr. H. Humphrey (highly commended), and Mr. J. J. Colman (first prize); and the animals may be fairly described in the aggregate as of exquisite symmetry, having the lines of beauty and the high finish which appeal to the educated yet not technically critical eye, and the economy of form and flesh which win the approval of the practical connoisseur.

The Report of the Judges of Shropshire sheep is so ample, and so exhaustive in its critical survey of the classes, that it would be superfluous to introduce any further description of the animals noticed therein. Whatever might be the differences of opinion upon the comparative merits of different sheep (and opinion, not merely that of outsiders, but of practised breeders, certainly did range very widely), it is not easy to contest the general conclusion of the Judges, that the Shropshire classes, although large, were, upon the whole, disappointing in quality. The figures of the Judges are given below exactly as they are written, but two should be subtracted from Class 167, in which withdrawals from number 2150 to 2153 reduced the actual number of entries to 70. The number of Shropshire entries was 116, of which 92 were rams (7 absent), and 24 were pens of ewes and lambs (2 absent), giving a total of 212 animals (17 absent). The Judges' remarks about shearing and disqualification have a general bearing upon the Show, and not upon the Shropshire classes exclusively:—

Class 167. *Shearling Rams.*—There were seventy-two entries in this class, and only few were absent.

In making our report we trust that the breeders will not be discouraged or disappointed if we pronounce this class below the average of the last few years. There were doubtless many good animals exhibited, but we failed to find anything particularly striking to lead us directly away from the general body, after devoting an unusually long period to their inspection, which has been commented on by some members of the press. Mr. Graham's first-prize animal was a stylish sheep, having ears rather objectionable in colour, and being not quite perfect in his hind quarters. The second prize was awarded to Mr. T. J. Mansell's, a sheep of good colour, scarcely up to our standard in colour at the back of the ears, and weak in his pasterns, which did not add to his appearance. The third prize we awarded to a sheep bred in Ireland by Mr. Naper, with a good fleece and particularly firm touch, neck not

over strong, and hind quarters not as fully developed as we could have wished.

Class 168. The twenty-two aged rams were a fair class, but it contained nothing calling for special remark. Amongst this class we found many with sore breasts, and we suggest that it is not desirable for exhibitors to introduce animals so affected into the show yard.

Class 169. There were nineteen pens of shearling ewes, containing several very good specimens, with few objectionable sheep amongst them.

Class 170. There were five entries of ewe lambs, and amongst them many creditable exhibits.

We were sorry to find several disqualifications in the classes under our notice, and regret that the course pursued at the Bristol meeting, when no inspectors of shearing were appointed, could not have been again adopted by the Council; but the infringements of the rule upon that occasion were too apparent. We trust that the unpleasant position in which many were placed, may prevent others from offending in like manner on future occasions.

R. H. Masfen.
John Evans.
Thomas Williams.

"Hampshire and other Short-woolled sheep" may be considered as the "Hampshire" classes without the "other," for with the exception of Mr. Sturgeon's few Merino sheep, which looked liked grains of barley accidentally spilled into a sample of wheat, the Hampshire or West country Downs had undisputed possession of the pens. The Merino sheep were there for the benefit of the public, as English specimens of their breed, but could scarcely be regarded as competing for the prizes, among sheep of so totally different a type. Prize-winning, however, is not the only legitimate object of exhibition.

In noticing the Hampshire sheep, it may be perhaps interesting to observe one point of contrast between them and the Southdowns, agreeing as they do, in the aggregate, in the possession of extraordinary merit. The improvement of the Southdown, up to the recognised ideal standard, is an accomplished fact, and in the classes of that breed a striking example has been seen of the possibility of multiplying animals of the highest character. Under the system of careful and judicious selection, *with one distinct type in view,* not only improvement but uniformity has been effected. In the process of improvement, we meet with, at intervals of increasing frequency, animals of uncommon worth—here and there one immensely in advance of his fellows. By making use of these splendid exceptions to the rule, our breeders have succeeded in making the rule a higher one than it was before, until at length they have obtained not an occasional "wonder," but uniform excellence; and all the care and power of the breeder is needed to keep his flock up to the point previously reached. Now the Hampshire sheep is perhaps not yet on the level top of the hill, but it is notably ascending,

and has already reached a great height in this stage of upward progress; the strongest are seen in advance; and surely the figure is verified in the magnificent animals exhibited at Kilburn by Mr. Alfred Morrison! The first-prize sheep in the aged class, a two-shear ram, was one of the most distinguished animals on the ground. Breeders of every variety of sheep, coming to look at him, were constrained to own his extraordinary merit. He has great size; his front is wonderful, yet it does not destroy the impression of true proportion throughout, and to the touch he is all that could be desired. In the shearling ram class Mr. Morrison gained all the three prizes, the first winner being a very superior sheep, indeed quite worthy, due allowance being made for difference in age, to stand beside the winning two-shear ram. Mr. Morrison did not exhibit in the shearling ewe class, but he took the first prize for lambs, Mr. James Read's ewes, large, good, and well-matched, winning the first and second prizes in a most admirable class. The following is the Report of the Judges:—

The Hampshire classes were fairly well filled, but several pens were empty, and amongst those that were there were some remarkably fine specimens of this most useful and rent-paying breed of sheep. It is pleasing to note the steady improvement that this class of sheep has of late years made, till they have become perfect in quality, with large size and early maturity.

Class 171. *Shearling Rams.*—Well represented, there being seventeen entries, but all the pens were not filled. The first, second, and third prize sheep were of good form and of superior quality.

Class 172. *Aged Rams.*—Here there were ten entries. The first prize sheep was a marvellously grand animal, of great size, and perfect in shape and quality; most of the others were only of average merit.

Class 173. *Shearling Ewes.*—There were twelve entries in this class, and, like the Southdowns, they were all remarkably good. The first and second prize pens were excellent specimens, possessing size and quality. The Judges commended the whole class.

Class 174. In this class for ewe lambs there were eight entries, two were absent, and three pens, 2284, 2285, and 2286 were disqualified, leaving only three pens to take the prizes offered. Had there been no disqualification, the prizes probably would have been awarded differently.

There were some Merinos exhibited in these classes, but they appeared to be out of place with the Hampshires.

Edwd. Little.
John A. Hempson.
Henry Overman.

Only two exhibitors contributed to the Cheviot classes, in which there were 8 entries of rams and 2 of ewes. Mr. Elliot gained three first and two second prizes; Mr. Robson the second prize for ewes, and the two reserves in the ram classes. The Judges, Messrs. Usher, Smith, and Rea, report that:—

The Cheviot sheep were poorly represented in numbers, but of good quality.

Black-faced mountain sheep had only 5 entries (two of shear-

ling, and two of aged rams, and one entry of ewes), belonging to three exhibitors, from Yorkshire, Essex, and the County Donegal; Scotland being unrepresented. As the Report of the Judges of Black-faced mountain sheep, Herdwicks, Lonks, and the Welsh mountain breed is not conveniently divisible, I venture to depart from the order of the Catalogue in favour of the classification of these breeds as assigned to the Judges. The classes are thus reviewed in the judicial Report:—

Black-faced.

Class 178. *Shearling Rams.*—We feel sorry that the numbers were few; and although there were only two competitors, we quite thought they both deserved a prize. The first prize animal is a good sheep.

Class 179. *Aged Rams.*—In this class, we are sorry to say, both the number was small and the quality very inferior. We considered it right to withhold both a second prize and a commendation.

Class 180. *Shearling Ewes.*—We thought fit to give these ewes a first prize, although there was no great merit in their quality and size.

Herdwicks.

Class 181. *Shearling Rams.*—This class we considered very good, and we had great difficulty in deciding the prizes. Since the last Royal Meeting we find a great improvement in the quality of wool, which is much more clear of black.

Class 182. *Rams of any other age.*—This class was quite as difficult to judge as the last, and we felt quite sorry that we could not in this instance give a third prize, as all the four entries were really good. The two commended ones were extra good sheep. This class of sheep is uncommonly hardy, and will live on poor mountain grass.

Class 183. *Shearling Ewes.*—This class was likewise good, and with the exception of one or two pens were more free from black wool.

Lonks.

Class 184. *Shearling Rams.*—Only one entry, but well deserving of the prize.

Class 185. *Rams of any age.*—Only one entry, but well deserving of the prize.

Class 186. *Shearling Ewes.*—Only one entry, but of extra goodness. It seems strange to the Judges that such an extraordinarily good sort of sheep should be represented in such small numbers.

Welsh Mountain Sheep.

Class 202. *Shearling Rams.*—We were glad to see so good an entry in this class, and with one or two exceptions the class was a good one.

Class 203. *Rams of any other age.*—This class was also well represented, and several of them were of good merit.

Class 204. *Shearling Ewes.*—This class was composed of a very nice lot of sheep; and in concluding our remarks on the Welsh sheep we feel quite confident that there might be a great improvement made with regard to the weight of wool. We were sorry to find also that many of the Welsh sheep were disqualified owing to their being improperly clipped. This ought to be a warning to *all* exhibitors, and we hope that for the future more notice will be taken of our remarks.

John Ingleby.
John Irving.
Edwd. Edwards.

All the Lonks exhibited were from the flock of Messrs. Green and Son, of Silsden.

The remark of the Judges upon the possibility of increasing the weight of wool of the Welsh sheep, is one deserving of earnest attention; and if admitted to be practicable, the improvement should be by all means attempted with equal earnestness of purpose. The great difficulty seems to be that of improving any kind of sheep, specially adapted to certain localities, by *crossing*. Such kinds of sheep, as a rule, must be improved by a slower process of selection, without the help of properties borrowed from other breeds. This was very clearly illustrated a few years ago by Mr. Peel, of Knowlmere, an eminently successful breeder of Lonk sheep, who tried to improve his flock by Southdown and Shropshire crosses, returning the offspring to the Lonk ram. The experiments signally failed, as all similar attempts with which I am familiar have failed. The sheep of the mountain or the heath will profitably cross with other breeds under altered circumstances of pasturage or climate, but not, so far as I have been enabled to observe, upon their own particular moor or mountain range. The improvement noticed by the Judges as having been effected in the colour of the Herdwick wool, certainly affords encouragement to hope that practical effect may be given to the Judges' suggestion about Welsh wool, without the sacrifice of purity of breed or special fitness for a certain locality.

The Herdwicks, whether tracing to an origin in the waifs of the Spanish Armada, or of still more ancient lodgment "in the arms of Helvellyn" and the neighbouring giants of Cumberland and Westmoreland, have been certainly improved within the last few years, but not by crossing. They can thrive where nothing but their own unmixed breed could live. The tourist may see them, at dizzy heights, sure-footed, mere specks on the narrow ledges of the precipitous rock; and thus enabled, by gradual and long-established adaptation to their circumstances, to scale the rock and brave the storm, they are pre-eminently fitted to turn the scanty and otherwise waste vegetation of the mountain into food and clothing for man.

In their own district, two classes of Herdwicks are recognized—the large and the small (so called only in comparison with one another), the sheep of different mountains and "fells" varying considerably in size and in colour also. Both, however, are small, and extremely fine in the bone. One of the larger sort, well fed, may reach 25 lbs. a quarter, but about half that weight would be probably nearer the average of the breed, large and small, for moderately fed four-year-old sheep. At Kilburn, of course, there was no subdivision of breed. Two of the three

flocks which supplied the principal winners, Mr. Nelson's and Mr. Leathes', are kept on the western side of the district which produces the Herdwicks. Mr. Browne's prize-takers came from a more inland part, Troutbeck.

Again, in order to introduce the Judges' notes more fitly, I must not follow closely the order of the breeds in the Catalogue; but, still leaving the Devon Longwool, turn to the Ryland, Somerset and Dorset, Dartmoor, Exmoor, and Limestone classes. As the Herdwick is specially adapted to the mountains and mountain spurs of the English lake district, and the Lonk to the high moors and "fells" on both sides of the adjoining borders of the counties of Lancaster and York (more intimately associated, by its name, with "Loncashire"), so the Limestone sheep has its own particular range on the quickly drying limestone crags of southern Westmoreland, partly projected into North Lancashire, and cannot live on a damp soil or in a misty atmosphere. The Atlantic clouds about Skiddaw, and the long-lying rain-water on the Yorkshire and Lancashire moors, would be alike fatal to him. As an illustration of what I am compelled to term the "localising" tendencies of sheep, I may mention the fact, that a flock of Black-faced mountain or moorland sheep, habituated for generations to one side of a certain hill, has been known to deteriorate and suffer loss on removal to the other side of the same hill. The ewes, however, of the Limestone breed, make invaluable stock to cross with the Leicester ram for the production of half-bred sheep suitable to the vales immediately below their native heights, although the pure breed is necessary for the crag, and the crag for the pure breed. The type, very much like the Dorset on a larger scale, was well represented in the five entries at Kilburn, all from one exhibitor; but the Inspectors of Shearing disqualified them all.

Mr. Wm. Taylor, who gained the two first prizes for Ryland sheep, was the only exhibitor.

The Somerset and Dorset horned breed had 14 entries, 10 of rams and four of pens of ewes, only one pen of ewes being absent. In each of the ram classes the contest was among the sheep of three exhibitors, all having very good specimens. Mr. Herbert Farthing took both prizes for shearling rams, and the second prize in the older ram class, Mr. J. C. Culverwell's three-shear taking the first; while in both classes Mr. John Mayo had the reserve and commended sheep. For ewes, Mr. Mayo gained the second prize and a commendation; a fourth exhibitor, Mr. E. G. Legg, bringing into competition an admirable pen of ewes, for which he received the first prize.

There is little to be added to the Judges' notes (given on p. 657) on the Dartmoor sheep, of which 15 rams and 15 ewes

(3 pens) were entered, and only 3 rams and 1 pen of ewes stayed at home. This is another of those breeds which are particularly suited to certain districts and to certain circumstances of soil and climate; and with regard to breeds of the kind, it is only fair to bear this in view in making any critical remarks upon them: where the salmon cannot come, the trout of the shallow brook or mountain rill is not to be despised.

Mrs. Langdon, whose herd of Devon cattle is among the very foremost in reputation, successfully exhibited some choice specimens of the smart little Exmoor sheep, winning in both ram classes the first prize over the entries of Lord Poltimore; while the Poltimore Park ewes turned the tables upon those of Flitton Barton.

The following is the Report of the Judges upon the group comprising the Ryland, Somerset, Exmoor, Dorset, Dartmoor, and Limestone breeds:—

In the first Class, 187, of Rylands, there were only two entries, the same number only competing in Class 188. According to our instructions we only awarded the first prize in each class, the second animals not being in our opinion of sufficient merit.

In Classes 193 and 194, Somerset and Dorset Horned, we had a much better entry for both the shearling and aged ram prizes. In the former we had some difficulty in separating the two best sheep, the one having good quality with good shoulders and fore ribs, and good wool, but a little wanting in his legs of mutton, whilst the other had better legs of mutton, but was not so good in his other points. We thought both classes deserved our commendation. In Class 195, ewes of the same breed, only three pens were exhibited. Two out of the three pens were very superior sheep, and well deserved the prizes they obtained. We considered this a good class of sheep, but rather lacking that good hardy look which sheep need that have to be out in all weathers, especially the kind of weather we had last winter and lately. The house seems more like their home than the field. They are good breeders, excellent mutton, and come early to maturity, qualities that the farmers of the present day need now more than ever to look to.

In the next Classes, 196, 197, and 198, Dartmoor, we had a good entry both of shearling and aged rams, but had no difficulty in selecting the two best, they being much superior to those that we did not place. The ewes were also easily judged, there being only three pens. These are good, strong, hardy-looking sheep, but lack quality both in wool and mutton; but it may be that they are the best kind of sheep for the neighbourhood of the moor from which they derive their name.

In the next Classes, 199, 200, 201, Exmoor sheep, we had not much competition, but all the exhibits were very good of their kind. This is a small, hardy-looking, and good-woolled kind of sheep. It has been suggested to us that this pretty little breed of sheep might be improved by a cross judiciously selected. Whether this would be compatible with their adaptability to their native hills, is a question we must leave to those whom it more immediately concerns.

The other Classes in our book, 205, 206, 207, Limestone, were adjudged by the Inspectors of Shearing to be disqualified. We saw all those classes, and think this decision was perhaps right. It will be a caution to future

exhibitors to be careful to avoid a repetition of any infringement of the Rules of the Society.

JOHN HOGARTH.
JAMES W. PAULL.
JOHN TAPP.

Devon Long-wool sheep had a fine class of shearling rams (18 entries, only 1 absent); and, still better, the personal merit of the animals was equal to their numerical strength. Fewer in number, yet excellent in quality, the aged rams (6 entries, all on the show-ground) also made a good class; and the 3 pens of shearling ewes entered and exhibited were all very creditable to the breeders. Messrs. W. and G. Bird sent five sheep to the shearling class, and had the first prize and a commendation, but did not exhibit in either of the other classes. Mr. A. Bowerman, who had three in each ram class, gained the first prize for a three-shear, and one of his shearlings was commended; and Sir J. H. H. Amory, exhibiting in all the classes, took the first prize for ewes, the second prize for his shearling ram, and both reserves for rams, besides several high commendations. Mr. R. Corner had the second prize in the aged class, for a good two-shear ram, and was highly commended for a shearling; and Messrs. J. N. Franklin and C. Norris were the remaining exhibitors, both successful in taking honours in the select little class of ewes. The same Judges, whose notes upon the Cotswold and Kentish sheep have been already extracted (Messrs. A. Warde, R. L. Cobb, and R. Garne), conclude their Report with the following general remark upon Devons:—

This class was excellent, the majority of the sheep being well formed, with heavy flesh and good wool.

Roscommon sheep, considering the distance and inconvenience of transit from Ireland, came out perhaps as strongly as might reasonably have been expected; but here the Inspectors of Shearing again interposed their fatal recommendation, and the whole class of shearling rams, comprising 3 entries, was accordingly disqualified. In the class for aged rams, the winners were Mr. B. Hannan's "Paddy-go-easy" and Mr. P. Merlehan's "Paddy Whack," and the same exhibitors won respectively the first and second prizes for ewes, theirs being the only two pens exhibited. The entries in all the Roscommon classes numbered eight; one pen of ewes being absent. The Judges, Messrs. J. Usher, W. Smith, and G. Rea, report:—

The Roscommons.—From the rules concerning clipping having been disregarded, several entries in these classes were disqualified, consequently animals of merit did not come under the notice of the Judges.

This remark presumably does not extend to the denial of

merit in the sheep to which prizes—vouchers of merit—were actually awarded, but is to be taken as meaning that, by disqualification, animals of merit were excluded. The merit, however, of the Roscommon classes, was not very great.

In three classes open to "other British Long-woolled breeds, not qualified to compete in any of the preceding classes of Long-woolled sheep," there were no entries.

In going over an exhibition of sheep, especially one upon so large a scale as that at Kilburn, one necessarily hears a great variety of opinions upon the animals, the judging, the Inspection of Shearing, and everything else connected with the classes. At Kilburn, unless it was the topic of the rain that exhausted the powers of grumblers, there was apparently less than average dissatisfaction in proportion to the magnitude of the Show, with regard to the decisions. With trifling exceptions, I very heartily concur in the Reports of the Judges; and in all cases, if not thoroughly in accord with them, I have deferred to their opinions, which are authoritative, and should be, I submit, cheerfully left undisputed by any exhibitors who may have expected better success than they met with. Differences of taste and judgment must always exist, but why let disappointment mar the harmony of men whose very rivalry should make them friends? The public see the animals exhibited, and those among them who know anything of live-stock will draw their own conclusions from their own observations. With regard to the question of disqualification, I feel bound to point out that in no case do the Judges express dissent from the opinions of the Inspectors, but that, on the contrary, in several instances, they are studious to avow their approval of the course which the Inspectors had taken.

Foreign Sheep.

The Foreign Sheep Department had its chief strength in the French Merino classes, and they, containing 12 rams and 3 pens of ewes, owed their prominence to the entries of only two exhibitors, M. Marin Bailleau, of Illiers, Eure-et-Loir, and M. Manceau Guerin of Chartres. M. Bailleau sent 6 rams and 1 pen of ewes, and won the first prize in each class, besides other honours. A year's difference in age was perhaps mainly accountable for some variation in the character and wool of his rams, but it was not wholly so. Possibly the exhibitor had selected representative specimens of two sub-types which his well-known flock can produce. His ewes, well matched in their general characteristics, differed a little in degrees of merit, the worst, however, being good, and the best a fine specimen

indeed. M. Guerin's two pens of ewes were also of excellent quality, winning second and reserve. His well-grown eighteen-months ram came in a good second between two of M. Bailleau's, and another high commendation was adjudged to a ram a year older from the same flock, which, like M. Bailleau's, contributed six entries of rams—just half the class. It is a matter of regret that the German Merino classes were empty, as the variation in type and wool, under different circumstances of selection, climate, and pasturage, would have been exceedingly interesting for comparison and study; and the foundation-stock of the breed, the Spanish Merino, was represented only by one ram and one pen of ewes, all bred in the Isle of Wight, and exhibited by Mr. H. H. Hammick, their breeder. It is difficult for the eye trained to appreciate the model forms of our own most highly improved breeds, to see beauty in the strikingly peculiar character of the Merino, whatever his modern nationality. We have grown accustomed to form our notions of beauty solely from models of utility; and thus, while educating the judgment in one direction, find it somewhat cramped when we look abroad. For this reason, perhaps, the Merinos at Kilburn did not receive from British sheep-breeders all the attention to which their world-wide fame and special claims as wool producers fairly entitled them; yet the Exhibition could not fail to do good (and it would have been proportionately more useful with better filled foreign classes), for there can be no question that international shows tend to remove prejudices and give expansiveness to tastes and judgment.

In the classes for pure Long-woolled Sheep, not Merinos, and pure Short-woolled Sheep, not Merinos, of any English or foreign race, bred in any country except the United Kingdom, there were few entries. In the Short-wool class the only representatives of foreign sheep were two rams and one pen of ewes of the white four-horned breed, exhibited by Mr. Watts, of Whistley House, Devizes, Wiltshire, and bred by himself in Peru upon the grass plains of the Andes. The rams have each four flat, curled, well-developed horns; the ewes sometimes have horns, of much less and slighter growth than those of the males, and sometimes only four small "horn-buds" (if they may be so called), vouchers for the full number of horns in their male offspring. These sheep are said to be prolific, capable of being grazed to good weight (wethers about 32 lbs., ewes 24 lbs. per quarter), and to yield a fair clip of wool. Mr. Watts told me that he has found the average about 7 lbs. or 8 lbs. the fleece, exclusive of the ewes' wool, which weighs about 1 lb. less; and his sheep, imported from Peru, do remarkably well, and gain in substance upon his Wiltshire farm.

The Long-woolled classes at Kilburn were monopolised by a French exhibitor, M. Céran Maillard, of Ste. Marie-du-Mont, Manche, who sent three rams and two pens of ewes of our own Leicester type, somewhat altered, however, under changed conditions of soil and climate. His entries were apparently selected to show the development of his sheep at different ages, a shearling, a two-shear, and a three-shear ram being sent, and pens of shearling and three-shear ewes. The two-shear ram was deservedly placed first, and the older ewes took due precedence of the younger, which were, although they might be considered a trifle light in the necks, certainly well-grown, promising animals.

Unfortunately the Report of the Judges of Foreign Sheep has not come in time for insertion here; but the following Report from the Judge of Wool may be appropriately introduced, and will be read with interest:—

"Classes 326 and 327.—Wool.

"The wool exhibited for prizes this year was a good representation of the different kinds grown in England, the entries being—English, 47; Irish, 3; Scotch, 1; Foreign (so called), 1.

"*English Wool.*—Some of the fleeces showed exceptionally good care and attention; notably No. 77 (Shropshire), John E. Farmer, of Felton, Ludlow, which, for length of staple, quality, and weight-giving properties, is very high. Also No. 90 (Lonk), John Green and Son, of Low House Farm, Silsden, Leeds. These are both in the shorter and finer wools. No. 56 (Border Leicester), Richard Tweedie, of The Forest, Catterick, Yorkshire; No. 63 (Lincoln), John Pears, of Mere, Lincoln; No. 72 (Oxfordshire), Henry F. Hill, of New Hall, Watford, Herts, in the longer wools; No. 84 (Black-faced Mountain), the Earl of Tankerville, of Chillingham Castle, Alnwick; and No. 89 (Herdwick), Edward Nelson, of Gatesgarth, Cockermouth, in the rougher and coarser sorts.

"*Irish Wool.*—The entries were very good, and proved that whilst meat received attention, the wool has also been looked after. The length of staple and fine quality of Nos. 103 and 104 (Roscommon), Benjamin Hannan, of Riverstone, Killucan, County Westmeath, are to be commended.

"*Scotch Wool.*—The single entry was of the Cheviot class, and was not such as to need any remark.

"*Foreign Wool.*—This class calls for no details.

"I think, as Judge, I ought to mention the bad and heavy condition of the British wool, as in several cases the fleeces had not been 'docked;' and also the objectionable way of packing all the locks and pieces there may be in the middle of the fleece. This method deteriorates the value of the wool.

"This being an International Show, it is very much to be regretted that our friends in France and other countries in Europe did not send some specimens to be shown to illustrate their varieties of wool; and Australia and New Zealand, where the growing of wool is carried to a great state of perfection, were not even represented. If some of these wools had been sent for exhibition (even if not for competition), it would have done some good, and would have shown our growers of wool that the great care and attention given to it in those colonies accounted for the high price such wool realises at the London wool-sales.

"R. Woodford Goddard."

The only entry in the class of foreign wool was one of samples of the fleeces of Mr. Watts's four-horned Peruvians.

Goats.

Goats, British and Foreign, made a good show, and attracted so much attention that it was impossible to doubt the established revival of interest in this country in a race of animals second to none, perhaps, in the antiquity of its service to man. The question, What is, and what is not, a "British" goat? may possibly afford scope for the exercise of some ingenuity in the art of definition. To what epoch of our history, or anterior to what precise date, must a breed trace its introduction, in order to justify its acceptance as a naturalised denizen of Great Britain? The horn has been declared an indispensable requisite of admission to the British goat-classes; yet in view of the unmistakeable concurrence of opinion of at least a large majority of well-informed breeders of goats, supported as it is by the remarks of the Judges in the subjoined Report, the reconsideration of this question seems advisable, in the event of a future exhibition of goats. We are constantly incorporating foreign elements. In this respect, probably, the modern British goat much resembles the modern Briton of the human race. The interest in goats is a growing one; and as more attention is year by year attracted to the subject, the desire for improvement provokes experiment, crosses are tried, and in course of time new permanent varieties are developed. These home-made breeds, although they are in some measure indebted to materials borrowed from other countries, can scarcely be classed among the aliens; and it is surely desirable to admit to competition (under proper classification) all varieties which can be shown to possess merit. Notwithstanding the restriction imposed by the Society, hornless goats were exhibited in the British department, and the Judges, in the absence of special notices of disqualification, accepted them as legitimate competitors. In Class 214, short-haired male goats, both the prize-winners, subsequently disqualified, were either virtually or totally hornless; and in that, and not in that class alone, there was at least a *soupçon* of foreign blood in some of the horned specimens which gained honourable notice. In the first instance the first prize in Class 214 was awarded to an animal with merely rudimentary horns, and the second to a perfectly polled specimen; but in consequence of a protest, these awards were cancelled, and the prizes passed to Miss F. A. C. Cresswell's "Prince Charlie," a long, level, good three-year-old, whose coat, however, looked a trifle threadbare; and the second to Professor Simonds's good and shapely yearling, "Bouncing

Billy." The class contained 7 entries. The next class, for females of the short-haired British varieties, had 11 entries (one absent), and was a good class in regard to the character of the animals. The Judges gave the preference to a rather homely looking matron, almost a giantess, of eight years, very useful, exhibited by Mr. F. A. Crisp, and Professor Simonds again took second honours in this class for "Lady Camden." "Size and milking features" were with the Judges avowedly the first considerations, "followed by shape, quality, and condition;" and as the judging was conducted upon the "points" system, wherever the competition was at all close, it is easy to conceive how a great-framed, deep milker, like Mr. Crisp's, took her first place, although wanting in what is termed "quality," and notwithstanding her age; for against that must be reckoned the fact that her fertility is very evidently not exhausted; and another fact, known to all who have watched the goat-classes at recent shows (and of course one of which the Judges were not ignorant), that the same animal gained the "milking prize" at the last Dairy Show, where her yield was found to be at the rate of 3 quarts per diem. The so-called long-haired British goats were few in number, 4 males and 3 females. In the male class, the first prize was adjudged to a remarkably handsome two-year-old, unquestionably long-haired, but not so unquestionably British, although described in the catalogue as Welsh. Once more a protest was delivered, and again the award rescinded; Professor Axe, therefore, took the first instead of the second prize for his "Pinner Duke," and the second passed to Mr. Crookenden's goat, which previously had the reserved number. In the female class all three entries were attractive-looking animals, Miss A. Jacomb's "Nina," in her ninth year, yet wearing well, and Mr. C. Daymon's "Nan," both accompanied by twin offspring, fully deserving the first and second places respectively assigned to them, while Miss J. Davies's seemed good enough for honours, had there been a third prize, or had either of her rivals failed to appear.

Foreign Goats mustered only 7 entries, long and short haired, horned and hornless, entering into general competition. The class of male goats, four in number, and all in their pens, comprised some grand animals, the Baroness Burdett-Coutts's hornless claret-black Hungarian being the grandest of them all. In the female class, Mr. G. M. Allender had entered a couple of the Pyrenean breed, but unfortunately they did not arrive, and the second prize was, upon the recommendation of the Judges, awarded to Professor Axe's Nubian, the only other one which made an appearance.

The following is the official Report of both Judges of Goats:—

British Goats.—The short-haired males formed a very good class, though but few were present. The best were two polled specimens of unusual merit, which at first received respectively first and second prizes, but were subsequently, on a protest being lodged, disqualified through being hornless, and thus coming under the restriction contained in the rules, which prohibited British goats without horns from competing. The first prize finally went to the reserve number, a well-shaped animal with good even back and great massiveness of frame; and the second to a younger specimen, showing great promise, which had previously been highly commended.

The short-haired females were equally well represented in point of quality. The chief winner was a coarsely built but remarkably large goat, with considerable depth of frame and wide hind-quarters, evincing great milking capabilities; being heavy in young, she was however not attractive to the eye. The second prize, on the contrary, was in high condition, with a short glossy coat, showing most beautiful symmetry and much quality of breed, but undersized and lacking the superior milking features of its rival. As the judging was performed with a view to practical utility rather than for beauty of form and condition, this goat scored the lesser number of points. No. 2464 possessed a very large and well-shaped udder, with good teats which told of abundance of milk, but being by nature really long-haired—its temporary shortness of coat in certain parts being due to the new growth of hair which had not reached its full length,—this animal was only highly commended, and ought strictly to have been disqualified for wrong entry. The same fate might fairly have attended No. 2460, of Abyssinian origin, whose place was amongst the foreign breeds.

In long-haired males the finest exhibit was a remarkably handsome Norwegian, which, not having any disqualification card against it, was placed first, but, a protest being subsequently raised on the ground of its foreign blood, was afterwards disqualified, and the prize given to a massive animal with long straight back and flowing hair, a good specimen of its class, but with an ill-shaped head, and horns rather too coarse.

The goat which gained highest honours in long-haired females had a good deep frame, well-rounded ribs, and a capacious udder, but through changing her coat, like many others, did not appear to advantage.

Foreign Goats.—The males, although few in number, were a fine selection. The first-prize winner, of Hungarian breed, exhibited by Lady Burdett-Coutts, was certainly the largest he-goat that has ever appeared at any show. He was devoid of horns, and had a fine head with broad chest, level back, and well-sprung ribs, without being too long in the leg. He measured 34 inches in height at the shoulder, and 46 inches in girth. The second prize was also an unusually fine animal, though standing two inches shorter than his rival; powerfully built, with massive neck and chest, but narrow in his hind-quarters, and with tail set rather too low.

Of the three females entered in the foreign division only one appeared, and as this was shockingly out of condition, though showing some good points as a milker, a second prize only was awarded.

We feel it necessary, in conclusion, to call attention to the restriction previously alluded to against British goats without horns, by which many good animals were prohibited from competition, and the entries rendered less numerous than they would otherwise have been. The restriction was the more to be regretted because it frustrated to a great extent the principal object of the Society in offering the prizes, as hornless goats are generally admitted by fanciers to be for practical purposes the best, and therefore most suited to improve the breeds generally of these islands. This fact has been

abundantly testified to at every show, but never more so than on the present occasion at Kilburn, where, whenever any hornless animals appeared in a class, they invariably scored the highest number of points.

H. S. Holmes-Pegler.
Walter Freeman.

Pigs.

The *Large White Breed* was represented by entries of 13 boars, 10 pens of three young breeding sows of the same litter, and 10 sows in single entry. The latter was quite the best class, and the Earl of Ellesmere's "Empress," and "Queen of Sheba" (titles are becoming fashionable in porcine nomenclature) deserved the two leading places, although they had no mean rivals in the entries of Mr. Peter Eden and Messrs. Howard. In the Older Boar Class also, Lord Ellesmere's entries were first and second, closely followed by one of Mr. Duckering's "Cultivators." There was too much hollowing of the face about some of the boars, contrary to the established type of the breed, and the Judges made a very good selection, as regards the outline of the head, in placing Messrs. Howard's young boar first in his class. In the pens of young sows there was nothing worthy of special remark.

The *Small White Breed*, in which a certain sort of resemblance to the pug-dog is orthodox—although we must take care not to allow the larger breed to become merely magnified specimens of the small-breed type,—was much more strongly represented as regards quality, and the numbers were, 25 boars, 5 pens of three sow pigs, and 15 breeding sows. The Earl of Ellesmere's herd was first again in a large and good class of young boars, but in a super-excellent class of older boars gained only second honours, Mr. Sanders Spencer's "Esau" taking the first. The class, 11 entries (two of which were absent), was so good that the Judges highly commended the whole, including other boars from the same herds and from those of Lord Moreton, Mr. C. E. Duckering, and Mr. A. Crowther. The Earl of Ellesmere's two pens of sow pigs won with tolerable ease over Mr. Spencer's three entries, thus paying off the score of defeat in the previous class; but there was no comparison between the classes, the boars being infinitely superior. In a strong contest, Lord Moreton's entry was first, and the Worsley Hall entry second, among the breeding sows.

The *Small Black Breed* was not quite so well supported as it might have been; the boars, with two or three creditable exceptions, showing only mediocre character. The sows, however, were very much better. With so many good herds of this variety as we have in the country, it is a pity that stronger

efforts were not made to place it in its true position before the public (of all countries) upon so important an occasion as the Show at Kilburn. The entries of Mr. Wheeler, of Long Compton, the Rev. W. Hooper, Mr. M. Walker, Mr. C. E. Duckering, and of the Duke of Hamilton, were the best specimens exhibited.

The *Berkshire* classes were strong in number, but not very even in quality. A little weeding would have given them a better appearance. Mr. Heber Humfrey maintained the long-established reputation of his breed by winning the first prizes for sow and boar. Mr. Arthur Stewart successfully exhibited some very good specimens in all the classes; and a couple of second prizes told favourably of the Latimer Berkshires. The Royal Agricultural College Farm also contributed some of superior quality; and Messrs. Walker, Fowler, Duckering, and W. Hewer, sent animals which fairly maintained the prestige of their several strains of this very useful breed. With the Large White Breed, the Berkshire has shared considerable danger of losing its typal peculiarities, from attempts to imitate the special features of other breeds; and the same tendency to cultivate extreme concavity of the outline of the head, which has been the mistake of some breeders of the large white sort, has manifested itself among the Berkshire breeders. Without the mention by name or number of any examples at Kilburn, the fact will be remembered that not there only, but at the shows for some years past, perpendicular foreheads and broken-bridge snouts have become more common than they were formerly; and it is perhaps not so certain that this "improvement" is accompanied by a proportionate improvement in either the quality of the flesh grown or the power of cheaply growing it. Are we not, indeed, in various breeds, sacrificing to the perfection of mould, which appeals to the eye in an inspection of living animals, much of the internal excellence which constitutes the worth of animals when they pass into the hands of the butcher and the bacon-curer? By establishing quickly fattening breeds, we have certainly made progress in the direction of economical food-production; but we must take heed not to go so far in improvement of the old-fashioned lean flitch as to leave nothing that can stand the fire. Now the Berkshire has a good character for "cutting-up," and he has, or had originally, a certain recognised type of head. Such coincidences are sometimes found to be inseparable (according to laws not yet, perhaps, traced out), and if one peculiarity of a breed be deliberately sacrificed, we should unquestionably assure ourselves that we are not with it losing some other property of more practical value. The Judges at Kilburn, happily, were wide

awake to these typal distinctions, and showed, by various awards, an intelligent appreciation of their importance.

Other Breeds were, from the excellence of the older boar and breeding-sow classes, rather striking features of the Show. The younger boars, although Mr. Nuttall won the first prize for a very good pig, were not as a class remarkable, and the sow pigs in pens of three were poor, some of them under-sized and in low condition. Mr. Nuttall's "Tichborne," first in the capital older class, is the sire of his first among the young boars. The Earl of Ellesmere's, and two exhibited by Mr. Peter Eden, were also very excellent pigs; while for sows, the Earl of Ellesmere again had both prizes, Mr. Eden following with a well-earned reserve. The Judges report:—

Class 218.—Very medium; showing an amount of cross-breeding.

Class 219.—Small competition; the first and second prizes going to animals of superior merit.

Class 220.—Below an average, and several disqualifications.

Class 221.—The large-bred sows were a good lot; the first prize being of great substance and superior quality.

Class 222.—Small boars of the white breed were a good class, the first honours going to a compact pig, very deep and level in flesh, and good hair; defeating a good-haired pig, but a little short in his quarter: several of the younger boars were absent.

Class 223.—The aged class, all so good as to be highly commended, the winners being good specimens: consequently, the competition was very close; but the superior quality of a fourteen-months aged pig gained him the first prize.

Class 224.—A poor competition.

Class 225.—The sows, like the boars, created a severe struggle for honours, the prize as well as the commended ones being of superior quality.

Class 226.—The small black boars in the younger class were very poor.

Class 227.—The aged ones were a little better, the prize going to a pig with a little deficient coat.

Class 228.—No entry.

Class 229.—This was the best lot in this section, the first-prize sow showing a great amount of constitution, and all were very good.

Class 230.—The Berkshires we found a large entry, but scarcely up to the quality of former years, excepting the prize-winners.

Class 231.—A lot of strong pigs, the first being of excellent quality, very even in flesh, good in head and hair, and defeating a good three-year-old pig, whose flesh is falling off his back, but having great frame.

Class 232.—A moderate class.

Class 233.—Berkshire sows have been for several years the most numerous class, and this year was no exception, but the quality of the whole was deficient excepting the placed animals, and we found nothing very special.

Class 234.—A poor small class of cross-bred boars.

Class 235.—This being a good class, the competition was close between the first three pigs: ultimately, a straight, heavy-fleshed animal was chosen for the premier honours.

Class 236.—Moderate.

Class 237.—Some very useful sows; the first prize going to a compact animal of great quality; the second being also good, with rather faulty loins.

We are happy to congratulate the Society on the absence of all overfed

animals in the above classes, and on the whole the quality was equal to former years, the disqualifications not being quite so numerous.

JOHN ANGUS.
JOHN LYNN.
JOSEPH SMITH.

We cannot hope to reach such a state of perfection that all shall be *couleur de rose* in the Report upon an International Show of the Royal Agricultural Society of England: indeed, the great usefulness of the Society's exhibitions of live-stock, whether national or international, is probably in the opportunities afforded to breeders of seeing both the weak and the strong points of all that is going on among them; as the great meetings in connection with art, science, and manufacture bring to light not only progress accomplished, but circumstances which impede progress. After fairly reviewing the various classes of sheep, goats, and pigs at Kilburn, and accepting as evidence, at its duly high value, the independent Reports of the Judges in the several departments, we must, I think, agree that the aggregate of testimony appears highly creditable to British breeders; and that the yearly exhibitions of the Society have greatly aided the development of merit, must be readily acknowledged. With regard to Foreign breeds, the want of stronger competition and more adequate representation is to be regretted. Many circumstances, including necessarily strict quarantine regulations, combined upon this occasion to deter owners from sending their stock to England.

XXV.—*Report on Butter, Cheese, Provisions, &c., at Kilburn.*

By Professor BALDWIN, of Glasnevin, Dublin.

THE Society has been pleased to invite me to report on forty-five classes of the great International Exhibition held at Kilburn. As many of these classes are of great importance, I accepted the office of official Reporter with great pleasure.

The Kilburn Show has been the third great International Agricultural Exhibition I have attended. The first was the great Meeting at Paris in 1856, and the second was at Battersea in 1862. I examined each of these great Shows with the keenest interest. I saw every animal, every implement and object of interest exhibited at each of them.

In extent, in variety, and above all in its educational aspects, the Kilburn Show far surpassed the others. In a few sections Battersea excelled it. In foreign stock the Paris Exhibition of 1856 surpassed it; but, taken as a whole, it throws both into the shade.

An International Exhibition fails unless it is planned on broad principles, and conducted in a way which is sure to produce lasting effects on the classes interested, and, above all, on the men who conduct provincial and district shows. It is from this point of view that the Show possessed the deepest interest, and that it can be best regarded as having been a great success.

The International Dairy was, in my judgment, the section of the Exhibition from which most permanent good will accrue to the landed interest of Great Britain and Ireland. This section was truly international. Our dairy business is more in need of immediate attention than any other branch of rural economy.

We have in the United Kingdom close on four millions of milch cows, and it is admitted that by improved modes of managing milk and its products the wealth obtained from these cows could be increased by many millions sterling. This brings me at once to the subject of

Butter.

There were nine classes of butter, viz. Classes 328 to 336, both inclusive. These classes commenced with Irish keeping-butter; then come English and Scotch, American, French, Scandinavian, Dutch; and finally butter from any other European country.

The prizes in all these classes were of the same value, viz.:—First, 5*l.*; second, 3*l.*

The competition for fresh butter was international, the prizes being—First, 10*l.*; second, 8*l.*; third, 6*l.*; fourth, 4*l.*

The opinions of the Judges, as far as they have been expressed in writing, are published here. Mr. Peacock, of Hammersmith, London, W., reports on all the sections in these terms,—

Class 328, 329, 330.—*Irish, Welsh and Scotch Butters.*—A general improvement.

Class 331. *Canadian Butter.*—Quality not up to the average, much of it heated in shipment; later makes of Canadian butters ought to command good attention in the London market.

Class 332. *French Butter.*—Quite up to average.

Class 333. *Scandinavian Butter.*—A very fine description, and likely to hold its own against any manufacture.

Class 334. *Dutch Butter.*—A very poor description, and not worthy of an award.

Class 336. *English, &c., Fresh Butter.*—Quite up to the usual average, and remarkably good, considering the inclement state of the weather.

On the whole, the Butter Section was well represented.

Mr. Burrows, of Tooley Street, London, S.E.; Mr. Watson, of Carr's Lane, Birmingham; and M. Delalonde, Rue d'Assas, Paris, report on Scandinavian butter as follows:—

Judging the butter in Class 333, we found the majority of it "first-class," and that which was not perfect required very little alteration or attention to make it such. We noticed in many instances that the butter-milk had not been all taken out, which is a very important matter in making butter of good keeping quality. The only other faults we could find were some weak-textured makes, also too much water allowed to remain in the butter, which spoilt it in competition with the finest shown, which had none of these three faults, thereby it obtained the Champion prize.

Class 335, or "Finland" butter, we found of a very low class and not fit to compete against Class 333, it being all strong-flavoured and in many instances rank, and not suitable for the London market.

The "Swedish" butter, which was awarded two prizes, was very fine, and nearly equalled the finest Danish.

M. Delalonde gives his own opinion in these words :—

I have not much to add to the Report that Messrs. Watson and Burrows have addressed to you. However, I believe that the manufacture of the butters that we have examined (well-made though they be) are still capable of being improved. The butters which I tasted are good, certainly, but I do not coincide perhaps entirely in the opinion of Messrs. Burrows and Watson as to the fineness or delicacy of these products.

Mr. Watson, in another separate communication, says :—

I would wish to add that while the Danish butter as a whole was *exceedingly* good, and very many of the exhibits showed a high state of excellence, and while some few of the exhibits from Sweden—made from *new grass* feed—showed almost an equally high state of excellence in quality and manufacture, I think it right to say that a large number of the exhibitors in the latter (Swedish) section, and nearly the whole of those from Finland, sent the products of the winter or early spring months, when the cattle were feeding partially and in some cases wholly upon dry or preserved (fodder) food, by no means so suitable for the production of fine quality of butter as that made when the *Cows* are feeding upon fresh grass food. The produce of the former (fodder-made) would not be nearly equal in quality, either in flavour or keeping properties, &c., and would not bring nearly so good a price in our English or any other market that I know of.

I have now to add some independent observations of my own, and before doing so have to express my regret that Professor Segelcke, of Copenhagen, who was one of the Judges, and who has devoted a great portion of his life to the study of butter, has made no report.

The Judges of butter at Kilburn had no easy duty to perform. I can bear testimony to the circumstances that they went through it with care and attention. On the day of the adjudication I met no person who questioned the awards; but, in a day or two after, some of them were freely criticised. I refer more especially to Irish and British keeping-butter. It is most difficult to judge keeping-butter soon after it is made up; and many of the specimens of British and Irish keeping-butter had been sent direct from the maker's hand to the Show. It is best to illustrate my argument. On the day of adjudi-

cation, one of the Judges, with whom I was discussing the subject, said to me the best specimen of keeping-butter in the Classes 328 (Irish), 329 (Welsh), and 330 (English and Scotch), was No. 113, which was exhibited by Mr. Richard Colley, of Tylfaen, Welshpool, Montgomeryshire, and which got first prize in its own class (329). The taste and flavour on this day were excellent; but after two days' keeping it was inferior to many of the specimens which obtained no prizes at all.

It is difficult to enter upon a criticism of this kind without giving offence; but my object is to state a fact rather than to criticise. Mr. Colley went in to win, and he succeeded; his butter—as Show-butter—was made up with great skill; but, as the object of the prize was to encourage the production of keeping-butter, it must be admitted that the Judges failed to carry out the object of the Society.

It is easier to find fault than to suggest remedies. The remedy for the state of things to which I am calling attention is to be found in a more searching test of the quality of keeping-butter than has been hitherto applied by Judges.

The Champion Prize of 10*l.* and a large Silver Medal for the best specimen of keeping-butter in the classes referred to gave an international character to this part of the show of butter. These honours were awarded to Mrs. Casperino de Lichtenberg, of Hessel, Srenaa, Jutland, for Lot 217, which also won first prize in its own class (333, Scandinavian butter). This specimen of butter was admirably prepared for market. Towards the close of the Show its superior keeping properties, as compared with our home-made specimens, became more and more manifest. Like much of the Scandinavian butter exhibited, it was solid and uniform in texture, and well-flavoured. This is the sort of butter which is beating our own butter in our own markets.

In this competition Danish butter-makers laboured under a disadvantage as compared with our own; for it takes about five days to bring butter from the capital of Denmark to London.

M. Delalonde does not think so highly of the fineness and flavour of the butters he examined as his colleagues. If he intends this remark to apply to the Champion-prize butter from Denmark and other Danish butter, I take leave to differ from him. It was as fine butter as could reasonably be expected.

A remark occurs in Mr. Watson's Report, to which it also becomes necessary to draw attention; I refer to the passage in which he says that the Swedish butter exhibited was made from new grass. Does he intend to convey the idea that it was made from this year's growth of permanent pasture? If so, I rather think he has made a mistake; for the grass there is chiefly artificial, or "Seeds," as we call it. When our dairy-farmers are

twitted with reference to the quality of Scandinavian and Norman butter, they usually say that the dairy-farmers of those countries have the advantage of new or pasture grasses at all seasons of the year. Now, they have no such advantage; and the sooner our dairy-farmers come to realise their true position in this respect the better.

We are beaten by the butter-makers of those countries not through any natural advantages, but by the sheer force of knowledge and skill. If we accept this truth, and apply the energy which has enabled us to place ourselves at the head of all countries in many branches of industry, we shall soon hold our own in dairy husbandry; but as long as we allow the notion to prevail that our rivals possess certain advantages which do not exist, we shall make little or no progress.

The good which may be done in a short time is well exemplified by a few facts relating to Denmark, which have been published by the Agricultural Society of that country.

About a quarter of a century ago the dairy practices of Denmark were rather more backward than our own. Since then the Royal Agricultural Society, the Government, and private individuals have co-operated in effecting a reform. Within the short space of twelve years they have increased the exports of butter from about 8,000,000 to about 26,000,000 lbs. It was not until 1871 that the first butter-kneading machine was introduced from America by Professor Segelcke, and this machine is now very generally used, and with great advantage. While the Danes have been paying special attention to milk and its products, and adopting new and improved systems and appliances, we, with few exceptions, have been pursuing the old systems.

It is idle to talk, as many do, of Scandinavia being more favoured by Nature in regard to the production of good butter than Great Britain and Ireland. As far as I can judge, the soil and climate of many parts of England and Ireland are as well suited to butter-making as those of any country need be. We make, here and there, as good butter as the Danish or any other people. In Denmark, butter-making is now practised on tolerably uniform principles, and the result is that the article is good and of uniform quality, and commands a ready sale. With us the production of a good article of uniform quality is not the rule. The few who make a first-class article command for it a ready private sale. The great bulk of our butter is inferior in quality and sells cheap. Speaking for Ireland, I do not see how a reform can be effected within a reasonable time, unless we adopt the factory or co-operative system in some form or other.

On the 600,000 holdings in Ireland, how few suitable dairies

exist! Of the 400,000 farms, every one of which is under 30 acres, the dairy accommodation is deplorably bad.

How this want is to be supplied in Ireland will, I have no doubt, be considered by the Royal Commission on Agricultural Depression. Meantime, landlords and farmers could co-operate in more ways than one. In most parts of Ireland the farms are so small that we cannot expect that the milk will be sent to factories. The sending of the cream is quite practicable; but a still more practicable plan is to take the butter fresh from the churn to factories and dress it for market.

I intended to go at length into the Irish butter business, which possesses interest to both English and Irish readers; but the subject will come more appropriately before the Assistant Commissioners appointed by the Government to inquire into agricultural depression in Ireland. In this Report I also intended to offer a few hints on butter-making; but in this I have been anticipated by the Council of the Society, at whose request Mr. Jenkins has produced a *brochure* of great value.

I need not occupy space in this part of the 'Journal' with a detailed notice of the prizes.

Many persons were surprised at the paucity and want of quality of Dutch keeping-butter, and the Judges very properly withheld the prizes.

In Class 335—other European countries than those named—an enormous number of entries were made by the Finnish Agricultural Society on the part of the farmers of Finland. That Society has taken great pains to explain the various means adopted in that country for producing good butter. They have itinerant dairy-instructors, and they have agricultural schools of various grades. In this class the first and second prizes were awarded to Swedish exhibitors. If they were eligible to compete, they deservedly won the prize; but it appeared to me that all Swedish keeping-butter should have competed in Class 333 (Scandinavian butter).

In Class 336—Fresh Butter—the competition was very keen. The prizes appeared to be very fairly won. There were no less than eight high commendations and fourteen commendations.

Cheese.

I had expected a larger and more interesting show of cheese. The prizes were most liberal in all the classes; yet they failed to attract a large number of entries in any class.

In several classes the prizes were withheld, as the list of awards will show.

Of English, American, and other cheese of British make, the Judges report as follows:—

We are sorry to have to report that nearly all the exhibits in the classes of English cheese were very inferior, possibly caused in some measure by the early period of the season preventing some from the finest dairies being sent in for competition; and we are of opinion that unless the tenant-farmers who make cheese at home pay more attention to its manufacture, so as to secure fine quality, they will be forced out of the market by the Americans. There is always a ready sale for the finest quality of English cheese at remunerative prices.

S. H. Cox.
James Hudson.
Thomas Rigby.

Only one of the Judges of Foreign Cheese has expressed his opinion in writing, and it is as follows:—

The Foreign Cheese exhibited at the Show was not good enough either for reward or favourable notice, and I very reluctantly consented to any prize being given except for one parcel of Roquefort.

I did not see my colleagues after leaving Kilburn, nor do I know the address of either of them. The less said about the cheese the better. I have the honour to be, yours respectfully,

M. Pratt.

In Great Britain a good deal of attention has been paid, for some years past, to improved modes of cheese-making. Dr. Voelcker's papers in this 'Journal' have been of great interest and value. Some, at least, of the improvements recently introduced are owing to the alarm created by the importation of good cheese from America. Our dairy-farmers did not expect any extensive import trade in American butter; but it was soon perceived that in an article like cheese the Americans would do a large trade with us. Looking to the extent of the trade, it is not easy to understand why American cheese-makers were so badly represented at Kilburn. In Class 345 (Canadian or American cheese) there was no award whatever. There were only four entries, and these were all made by Mr. Martin, of Kingston, Canada.

It is highly probable that if we bring adequate knowledge and skill to bear on the production and treatment of milk as well as on the art of cheese-making, we shall hold our own against America. The point in which the Americans are likely to excel us most is the breeding of suitable stock. In America an effort is being made to reduce stock-breeding to a science; whereas in these countries too many farmers breed cattle with little regard to a fixed object or to established principles. Considering the unfavourable season at which some of the British cheeses were made, it appeared to me that they were not all inferior in quality. I do not presume to put my judgment

against that of the Judges; but after having paid attention to cheese-making, and knowing something of its difficulties, I cannot forbear saying that, under all the circumstances, such cheeses as those for which Mr. Carrington obtained first prizes do not deserve to be called inferior.

In the Class (346) of Edam cheese, only the second prize was awarded.

In the Class (347), Gruyère cheese, the first but not the second was awarded. In the next two classes, Parmesan and Gorgonzola, there was no award at all.

In Class 350, Camembert cheese, the Judges were justified in giving both the prizes and a commendation.

Of the celebrated Roquefort cheese the first prize was awarded to M. Etienne Coupiac, of Roquefort, Aveyron, for a really good cheese, and one which does not in my judgment merit the wholesale censure of Mr. Pratt. Possibly he would not apply his condemnation to this cheese. Like myself and others, he was disappointed with the paucity of the entries; and in writing his Report he felt himself called upon to speak plainly. If a few men among us would do for our dairy-farmers what M. Coupiac has done for the sheep-owners of Roquefort, who produce this celebrated cheese, one of the many causes of agricultural depression would be removed.

The manufacture of Roquefort cheese is one of the most interesting branches of industry which I have ever examined. Several years have elapsed since I saw it; and since that time I may say it has been revolutionised chiefly through the exertions of M. Coupiac.

Roquefort cheese affects beneficially upwards of 50,000 people of all classes. According to 'l'Industrie laitière,' about 700,000 sheep, including 450,000 breeding-ewes, have been kept in the district for this industry; and their produce realises annually from 15,000,000 to 20,000,000 francs.

The average value of the milk of the ewes has increased from 21 francs in 1867 to 30 francs in 1877, chiefly owing to the increased attention bestowed on the breeding and care of the sheep. The production of the cheese has risen from 250,000 kilos in 1800 to 750,000 kilos in 1840, and 4,500,000 kilos in 1878!

Several public bodies watch over this interest, the most powerful of which is the *Society of the united Caves* of Roquefort, and of this body M. Coupiac is President. That Society has established an agricultural bank, which advanced last year to the producers of Roquefort cheese and its other customers upwards of 1,500,000 francs on commercial principles. What great advantages would accrue from such an institution in those

districts of the West of Ireland in which prevails that vile code of usury called the *Gombeen* system, by which vast numbers of small farmers have been depressed, if not ruined!

Hams and Bacon.

There were three Classes of Hams—British, American, and Foreign—and three corresponding Classes of Bacon. There were three prizes in each class, viz., first, 15*l.*; second, 10*l.*; third, 5*l.* It will be admitted that these were liberal prizes. They failed, however, to attract adequate competition. Bearing in mind the magnitude of the trade interested, few if any sections of the Show were so inadequately filled. The provision trade is one of great importance. I have paid special attention to it in Ireland, where the pig forms, as is well known, no inconsiderable feature of rural industry, and where the curing of hams and bacon is a most important branch of manufacture. To this section of the Kilburn Show I therefore naturally looked forward with interest.

Whilst in common with all who visited these classes I was disappointed that many of the great curing houses had not exhibited, there was no reason to regret the time which I devoted to this section of the Show.

It gave me an opportunity of discussing many points of interest with the two intelligent and painstaking Judges, Mr. Kleinwort, of 17, Water Lane, London (and a native of Germany), and my countryman, Mr. R. H. Thompson, now of 13, Wellington Chambers, London, E.C.

Before offering any opinion of my own, I wish to submit their able Report:—

In fulfilment of the duties we have undertaken, we beg to submit the following remarks respecting the department of "The Agricultural Exhibition" at Kilburn in which we have acted as Judges, viz., the Provision Department.

We regret very much it was so poorly represented, especially in Classes 356 and 358, as in neither of these did the houses most widely known in the trade enter as competitors. And here we may say it would have been preferable if the goods shown in these two classes had been divided into sections, for instance:

Class 356. 1. 892, 893, 897, 898. (Wiltshire cut.)
2. 894, 895, 896, 897, 900, 903. (Cumberland cut.)
3. 899, 901, 902. (Staffordshire cut.)

In the items of Section No. 1 were represented sides of *singed* bacon of Wiltshire cut.

The demand for bacon cut and cured after this fashion extends over the whole of England, and in the London district about 6000 to 7000 bales of this description (the produce of, say, 13,000 to 16,000 hogs, the manufacture

of houses in Waterford, Cork, Limerick and Hamburg) are sold every week; whilst for sides of the cut and cure in sections numbered 2 and 3 there is, comparatively, but a local demand; it was therefore, in our opinion, not judicious to have placed all these descriptions in one section for competition.

There is but a small demand in London for bacon such as was represented in No. 2 section, and at rates considerably below those paid for such as in No. 1 section; whilst for bacon, such as No. 3 section, we have little hesitation in saying that in the London market it would not fetch 30s. per cwt., as in Staffordshire cut bacon the lean of the back is usually cut away; and in the sample presented to us the sides were enormously fat.

As, then, the most important portion of the bacon trade of this country is centred in the Wiltshire cut singed bacon, we think it right to say that the great desideratum is that farmers should aim at producing hogs suitable for this branch of the trade, and for this is required a breed of hogs with lean backs and fat bellies.

The amount of money lost to the farming interest annually by the production of over-fat pigs is beyond computation, for the great bulk of the population will not use fat bacon unless at prices varying, according to circumstances, from 10s. to 14s. per cwt. under the prices obtained for bacon the produce of lean-backed pigs; and the weight of such that brings the highest price for producing bacon of the Classes No. 356 and 358 ranges from 1 cwt. 1 qr. 7 lbs. to 1 cwt. 2 qrs. 7 lbs. per pig.

RICHARD H. THOMPSON.
JUL. KLEINWORT.

The Judges here question the propriety of bringing into competition the full or Wiltshire cut with, for example, the Cumberland or three-quarter cut; but I am inclined to think that the work of the Society would be too elaborate and detailed on this occasion if they gave prizes for all sorts and classes of bacon. The opinion of the Judges was possibly modified when, after the adjudication, it was found that their awards had given general satisfaction.

In the Report of Messrs. Thompson and Kleinwort there is one point which demands the most serious consideration; and that is, where they refer to the sort of pig which would pay the farmer best. When those gentlemen had completed their awards, I invited them to accompany me to the swine classes of the Show, in the hope of being able to elicit some ideas which might be useful to myself and to others, whom I could influence, in the breeding of pigs. We examined the pigs with care; and it was remarkable how their ideas and those of the leading pig-breeders differ as to the "points" which a good pig should possess.

Over and over again the same view had been previously forced on my attention in Ireland. As a rule, pigs are bred with little or no attention to what is required by the bacon-curer and consumer. Now, bacon of the highest quality is made from pigs of moderate size, on the backs of which there is not more than two "fingers" of fat. To most of the prize pigs Messrs. Thompson and Kleinwort objected. It may be said that they

are not the best Judges of the sorts of pigs which pay best everywhere. All I want to suggest is that there is no reason why the farmer should not make more money by rearing the pig in which fat and lean are more blended in the proportions which realize the highest price.

I have bred pigs of pure white breeds and of pure black breeds; I have crossed these breeds; I have crossed them with common pigs: I have done all this in order to arrive at a knowledge of the most profitable pig; but have found that our way of marketing is so rough and unsatisfactory, that the buyer, who acted for the bacon-curer, got all the advantage. I am fully aware that the buyer does not give so high a price for a pig which is all belly, like that which is met with in some parts of the West of Ireland, as for a well-shaped pig; but if I were to breed the very style of pigs suggested by Messrs. Thompson and Kleinwort, I should not get as much for them in any fair or market with which I am acquainted as for the pure Yorkshire or pure Berkshire which I breed now.

If the bacon-curers desire to encourage a pig of any set of points, they must begin by giving an increase of price to the farmer.

A criticism on the quality of the hams and bacon will not be expected in this Report; and the award-list will show that in American and foreign hams and bacon there was no competition.

Preserved Meats.

There were ten classes of preserved meats; in eight of which there was no competition.

In the first of these classes (Class 339, Preserved Beef), the prize of 10*l.* was awarded to Messrs. Low, Hackdale, and Co., of 4, Billiter Street, London. The St. Louis Beef Curing Company, of St. Louis, Missouri, United States, had also an entry. The Judges have made no Report, but I can say that they were rather disappointed with both specimens, and they were greatly disappointed with the entire section.

In the sections intended for Preserved Mutton and Preserved Pork, I was surprised that there was no entry, notwithstanding that a prize of 10*l.* was offered for each. In the classes of Preserved Poultry and Preserved Game, the want of competition was said to be owing to the smallness of the prize of 5*l.*: but this will not explain the total absence of competition in the four classes of American or European Fresh Meat, in each of which a prize of 25*l.* was offered.

Perry and Cider.

The demand for these delightful drinks has fallen off immensely since the people have acquired a taste for beer, ale, and porter. I know certain districts in which orchard cultivation has been neglected. In Canada and the United States the growth of apples has increased. We import from these countries large quantities of apples, for some of which we pay 2*d.* and 3*d.* a-piece in the retail shops.

The Canadians and Americans bestow great care and attention on the rearing of good trees and on the production of good varieties. If we did the same thing, orchard cultivation would pay us; and with every extension of our orchards there would arise, in all probability, an increase in the manufacture of cider. I append the Report of the Judges on these classes:—

We the undersigned, being the Judges of Cider and Perry at the Royal Agricultural Society's Show at Kilburn in 1879, beg to report as follows:

That the samples of perry exhibited were not of a character to call for any special Report, being in our opinion of a medium quality.

That the samples of Devonshire and Herefordshire cider in cask were better represented, but were not of any particular merit, lacking the body and richness which good cider ought to possess.

That the samples of Devonshire and Hereford cider in bottles, taken as a whole, were of superior merit to the general class of cider shown in casks.

H. C. Beddoe.
Thomas Maye.
William Gaymer.

XXVI.—*Report on the Bees, Hives, Honey, and Manipulations with Bees, at the Kilburn Show*, 1879.

The prizes in this Department were offered by the British Bee-keepers' Association, which was established in the year 1874, with the twofold object of advocating the more humane and intelligent treatment of the honey-bee, and of bettering the condition of agricultural labourers and other cottagers by the encouragement, improvement, and advancement of bee-culture. The Report of the Judges is as follows:—

In making our Report on the Bees, Hives, Honey, and manipulations in connection with the Society's Show at Kilburn, we, the Judges, remarked the great popularity and undoubted success of this attempt to introduce to the notice of British agriculturists the improved methods of bee culture which now prevail both at home and on the great continents of Europe and America.

That bees perform an important part in agriculture, the advantages of which cannot be over-estimated, in the production of seed, fruit, &c., is an undoubted fact. This was illustrated in our colony of New Zealand. Before the late Rev. W. C. Cotton introduced the honey-bee in 1842, the colonists

were obliged to import Dutch clover-seed (*Trifolium repens*) annually, but, owing to the introduction of the honey-bee, they are now able to export it.

There can be no doubt, judging from the crowds by which the exhibition was daily visited, the extreme interest evinced by the public generally in the manipulations of living bees, and the explanations so ably given by some of our leading apiarians, that this department of our great annual national show was one of the most attractive of the entire exhibition.

We earnestly trust that the science of apiculture, which in ancient times was always considered a branch of agriculture—and although a small matter, it is by no means an unimportant one: "*In tenui labor, at tenuis non gloria*," as Virgil sang of old—may become better known and appreciated by the agricultural community at large from its exhibition having assigned to it a portion of the Royal Society's patronage at its annually recurring Show.

In the department for Observatory Hives there were eight entries, displaying the advance made of late years in this class of hive.

The hive of Mr. Freeman was a model of neatness of construction, and we had no hesitation in awarding to it the first prize. It consists of six frames which when closed—three in front, and three at back—have communication with the entrance by means of a channel, through which the bees pass to and fro. The two outside frames of each set of three are movable, and turn upon a pivot, while the third, and centre one, is fixed; and all communicate with a central opening through which the bees pass from all combs, and enter the channel in connection with the entrance to the hive. Each frame is enclosed in glass, rendering both sides of the combs visible.

Mr. Brice Wilson, of Newbury, Berks, obtained second prize with a hive of most ingenious construction, containing also six frames, but differing from the former in having all its frames movable. These are placed on the sides of a hexagon, and can be joined together to form a compact hive for the preservation of heat during the winter months.

Mr. Abbott's third-prize hive was of very simple and less costly construction. It is intended to be fixed to a wall, and moved horizontally at pleasure, the combs being placed vertically, one above the other.

In Class 375, "For the best Hive on the movable comb principle, with best arrangements for securing a Harvest of Comb Honey, with covering and Stand, complete," there were twenty entries, and Messrs. Abbott, of Fairlawn, Southall, received the first prize for their hive "Superlative," No. 985, there being no other exhibit which united so many combinations of almost every principle adapted for securing a large honey harvest, in portable and saleable form, together with practical utility as regards the wintering of the bees, and the inducement to work in its supers. Space will not permit of our fully describing the principles involved in this hive, but its chief features are, great facility for increasing or diminishing the size of the hive to any extent desired, adaptation to the systems of supers, nadirs, collateral or longitudinal deprivation, natural or artificial swarming; and last, but not least, the facility with which any portion of the combs of the hive may be withdrawn for manipulation in the extractor.

The second prize was awarded to Mr. J. M. Hooker, of Sevenoaks, for his hive the "Alexandra," the construction of which for strength, solidity, and soundness of material leaves nothing to be desired. Its chief feature consists in the placing of a duplicate hive above the stock-hive, by means of which a swarm issuing from the parent hive can be placed over it until furnished with comb and brood, when stock and swarm are again united, royal quarrels settled by combat or otherwise, and overflowing population secured for work in supers, for which the usual arrangements are made, tiers of sections being placed collaterally, and provision for super deprivation: another advantage being the movability of the combs of the hive laterally, free from any disturbance of supers.

Mr. Neighbour secured third prize, his hive being adapted for working sections, both laterally and as supers, having also the same advantages as the former hive for the lateral movement of the hive frames.

Mr. Lee, of Bagshot, reserve and highly commended, No. 975, whose hive was a model of neatness and skilful workmanship, deserves special mention, his dummy being a novel but practical idea.

Messrs. Clapp, of Abbot's Hill, and Thorne, of Ashwell, Herts, fully merited the high commendations which they received.

On the whole, we have no hesitation in reporting this class most excellent, and in stating our belief that in no other nation could such a collection of hives, either as regards principle or workmanship, be brought together, the competition being unusually severe.

In Class 376—"Honey in sectional Supers, not exceeding 3 lbs. each section"—the show, doubtless in consequence of the unfavourable season, and the early time of holding it, was but a poor one. With the exception of Mr. Thurber's display of upwards of one ton of honey-comb, in small sectional supers, there was no entry of any note. This obtained first prize, but the quality was by no means equal to first-class English honey, and if America cannot supply us with a finer quality than this, we have no fear of her much-dreaded competition in our honey-market.

The second prize was awarded to Mr. Thorne, for sections, which were only partially sealed; and third to M. Lucio Paglia, an Italian exhibitor, for sections also, to which the same remark applies.

An American honey-extractor, in which the combs are emptied by means of centrifugal force, and afterwards replaced in the hive to be refilled, attracted much attention.

No English machine of the kind was exhibited, in consequence, no doubt, of there being no class or prize assigned in the schedule.

We noticed also several smaller apiarian appliances, which need not be here specified, but which are well calculated to advance the science, and most useful to manipulators.

The only other subject requiring mention is the Driving Competition, by far the most attractive portion of the show. This was witnessed by thousands with the greatest interest; and the people were taught, by demonstrations, descriptions, and lectures, the loss sustained by themselves and the country at large from the wasteful practice of suffocating the bees in order to obtain the honey from even the common straw-hive. Mr. C. N. Abbott, the editor of the 'British Bee Journal,' was the most successful competitor, driving his bees from the old-fashioned straw-skep, capturing the queen in the ascent, and transferring the combs and bees to a bar-frame hive, in the space of 14 minutes 35 seconds.

Mr. Baldwin, the expert of the British Bee-keepers' Association, obtained second prize, occupying under the same operation 18 minutes 5 seconds; and Mr. Martin, a cottager of High Wycombe, took third prize, performing his work in 19 minutes 20 seconds. These manipulators, judging from the cool manner in which they handled their bees, captured their queens, and transferred the combs, were evidently able tacticians, and skilled veterans in bee-culture and practice.

We cannot conclude these remarks without paying a tribute of well-earned praise to the officials of the British Bee-keepers' Association, who, under most trying circumstances and unseasonable weather, carried out their programme in such a manner as to give general satisfaction to all concerned; and the Bee Show at Kilburn will long be remembered as an epoch in the apiarian annals of this country.

WILLIAM CARR.
GEORGE RAYNOR.
THOMAS WM. COWAN.

July 2, 1879.

XXVII.—*Report upon the Exhibition of Hops at Kilburn.* By Charles Whitehead, F.L.S., F.G.S., &c., of Barming House, Maidstone, Steward.

Since the Canterbury Show in 1860 there has been no exhibition of hops in connection with the Royal Agricultural Society of England until this year. It was most unfortunate that the season of 1878 was unpropitious for hop-producing, so that the crop was for the most part of indifferent quality and low colour. This materially tended to prevent hop-planters from entering samples, as however good the management of hops may be in the oast-house, condition and colour cannot be imparted to them unless they have been grown under the influences of favourable weather; and those who grew their hops badly in 1878 did not choose to risk their reputation by showing blighted, rusty, or mouldy samples.

There were some good hops produced in certain districts where blight and rust and mould did not prevail; for example, in Farnham, Worcestershire, and Herefordshire: from the two last-named counties the competition was most satisfactory, and several of the samples were of excellent quality and gave proof of careful management.

No doubt, in many cases, planters, especially those cultivating only a few acres, did not like to lock up a pocket of hops for many months, and did not enter for this reason. This could not have been avoided, as it was absolutely necessary that a pocket should be exhibited, and a sample taken from it at the time of exhibition.

The pockets were sampled, in the presence of the Steward, on the Friday previous to the opening day of the Show, in order that the hops might be some time in the paper. One sample of the ordinary size was taken for the Judges from each pocket, and a large sample also, which was placed in the shed for the inspection of the public.

The judging commenced on Monday at 10 a.m. The following is the Report of the Judges:—

Report of the Judges on Hops.

Class 316–323.

In concluding their awards the Judges deem it necessary to attach the following report.

We cannot forbear remarking, in the first place, on the comparatively small number of entries by English growers; and can only account for this on the supposition that the crop of 1878 was generally inferior both in quality and appearance to many previous growths, offering little inducement to growers to exhibit their samples.

Notwithstanding this drawback, we are glad to have been able to include

in our awards several very good samples, and notably those in the East and Mid Kent classes, and also Worcester and Farnham. In the former of these, the judging was rendered very difficult by the fact of so many samples being nearly alike as regards flavour and management.

We consider it our duty to protest strongly against foreign samples being exhibited by others than the growers, while in the case of the English entries a certificate and guarantee are required in every instance that all samples shown are actually grown by the exhibitors.

We also think it objectionable that the prizes on Foreign Hops *only* should be exchangeable for medals, which option is denied to the English exhibitor. It is needless to point out the great commercial advantage thus furnished to the foreign exhibitor (he not being a grower) to the prejudice of his English competitor.

In the Foreign Class the samples were mostly inferior, the curing and management very indifferent, and, with one or two exceptions, not suitable for English requirements, rendering it a matter of doubt to us whether we ought to have made our award of prizes in that class at all.

J. T. Noakes,
Wm. Gridley,
July 6, 1879. M. Trier.

There were eleven entries in the class for East Kent hops. These were for the most part sound and very useful hops, and of good quality, considering the nature of the season. Some of the samples had pretensions to the brilliant colour of East Kent hops grown under highly favourable conditions. Mr. Gambrill's first-prize sample possessed great brewing value, and showed signs of care and judgment in the growth and picking and drying of the hops. The second- and third-prize samples, belonging to Messrs. Marten and Neame, gave evidence of high cultivation and judicious manipulation, and the whole class fully exercised the skill of the Judges.

Only five entries were made of Mid Kent hops, for the blight sorely vexed this district. There was not much trouble in deciding that Lord Darnley's rich, thick, well-managed sample was worthy of the first prize, nor that Mr. Freeman's hops ranked next in point of flavour and quality and skilful treatment. As there were only five entries in this class, the Judges could not award a third prize.

Although many good hops were produced in the Weald of Kent in 1878, only two planters entered for competition. Mr. Buss of Horsmanden was awarded the first prize for his deserving sample, which evidently had been most fairly selected from out of a very large growth.

The two lots which represented the whole Sussex district, comprising 11,000 acres, were of poor quality and indifferent colour, besides being badly "crusted" from having been kept in a damp storeroom, so that the Judges did not consider either worthy of a prize.

It was most disappointing to see only four pockets of Farn-

hams, notwithstanding the fact that many good bright hops were grown in Surrey and Hampshire in the last season.

Mr. Barrett took the first prize with a fine sample, which displayed first-class management and most careful picking; and to Mr. James Walker of Petersfield the second prize was awarded for a well-grown and well-manipulated sample of "Country Farnhams."

The Judges had an especially difficult task in the class for Worcestershire and Herefordshire hops, in which there were fourteen entries. Some of these were splendid hops, giving indications of the highest cultivation, most elaborate picking, and good management in the kilns. Mr. John Smith Walker, of Knightwick, Worcester, whose skill in the production of hops and fruit is well known, took the first and third prizes with brilliant specimens; and Mr. Hopkins, of Wick, Worcester, who spares no expense in hop-growing, carried off the second prize with finely-coloured, "greasy" hops, which had been dried upon his patent kilns at a comparatively low temperature. Mr. Hopkins's entry, No. 37 in the Catalogue, had much merit; and all the exhibitors in the class must be congratulated upon the skill and care which they had bestowed upon their hop cultivation and management. It is to be regretted that Mr. Bomford's pocket, from delay in its delivery, was not in its place in time to be sampled with the other pockets.

For the prize of 20*l.* for the best pocket of hops grown in any other district of England, there was only one competitor—Mr. Lousley of Hagbourne, Didcot, Berkshire. As Mr. Lousley's hops were fairly good, the Judges awarded him the prize. Another pocket was entered in this class by Mr. Stubbs of Petersfield; but as these were "Country Farnhams," it was obvious that they should have been entered in the class for Farnhams, and could not be allowed to compete with "hops grown in any other district in England."

The Mansion House Committee offered prizes of 20*l.*, 10*l.*, and 5*l.* for foreign hops in one class, and in this there were fourteen entries, eight of which were made by the same firm—Messrs. Barth and Son, hop-merchants, of Nuremberg, Bavaria. With one or two exceptions the hops exhibited in this class were Bavarians, of most indifferent quality, badly grown, and badly cured; and it is not by any means strange that the Judges should have doubted whether they were justified in awarding prizes to any of the samples.

Some of the hops exhibited in this class were packed in iron cases, whose tops were tightly screwed down. Some were pressed into oblong blocks, and covered with thick tinfoil, with the joints soldered so as to be almost hermetically sealed. In

one instance where the hops had been thus packed since 1875, they were perfectly preserved, though possessed of few intrinsic qualities worthy of such careful preservation.

It was disappointing to find this class of such ordinary merit, as well as to note that no entries had been made from America, whose hops have competed greatly with the English, and have been much improved in appearance, aroma, and quality in the last few years.

With regard to the remarks made by the Judges as to foreign samples being exhibited by other than the actual producers, while English hops could only be shown by the growers themselves,—it must be said that the offer of prizes for foreign hops was not published until long after the hops had left the growers' hands, and that it is usual for the greater part of the growers in the chief German hop-producing districts to sell their hops when only half-dried to middle-men, who dry them thoroughly and pack them for the markets. Under these circumstances, if the competition had been restricted to growers solely there would have been an utter absence of entries.

The Judges also have objected to the option given to the exhibitors of foreign hops to have medals instead of money prizes, while such option is denied to the English exhibitors. The answer to this is that the prizes in this class were offered by the Mansion House Committee, and not by the Council of the Royal Agricultural Society; and that the holders of the first, second, and third prizes in the various classes of English hops may label their hops accordingly, and obtain precisely the same commercial advantages as the foreign exhibitors who may have elected to take medals instead of money.

Very many persons visited the hop-shed, and appeared to take much interest in the somewhat novel exhibition, although it was placed far away from the entrance, and was surrounded with lagoons of mud.

XXVIII.—*Report on the Exhibition of Implements at Kilburn.*

By G. H. Sanday, of Wensley House, Bedale, Senior Steward.

In making my Report as Senior Steward of Implements for the Show of 1879, it falls to my lot to speak of an Exhibition which for size and interest has never before been equalled, and at the same time to chronicle such a series of disasters, brought about by the inclemency of the weather, which are without a parallel in the annals of the Society.

Most people are wise after the event, and many suggestions were made during the Show of what ought to have been done, one of which was that the whole ground should have been asphalted, which, at a rough calculation, would have cost about 100,000*l.* There is no doubt that could such a state of things have been foreseen, much might and would have been done to obviate the difficulties that afterwards arose, and it may be that we had not fully realised the enormous growth of the Exhibition or the vast weight of machinery to be brought on to the ground; but I, for one, will vouch that it was not for lack of forethought or exertion on the part of all concerned, more especially of our indefatigable Secretary and the Steward of General Arrangements.

The ground, which was about 100 acres in extent, had been thoroughly drained during the previous winter, at a cost of upwards of 1100*l.*, but owing to the severity of the weather this work was prolonged much longer than under ordinary circumstances it would have been, and it was February before it was completed, and the ground consequently had not the time to settle that it should have had. There is no doubt, however, that the drainage acted thoroughly during the whole of the meeting, although in some of the newspaper reports I saw it stated that the drainage had been more than useless. Beyond the drainage there was a further sum of about 2500*l.* expended in levelling, road-making, &c., before the commencement of the Show. The implements took up considerably more than one-third of the whole yard, there being 22,903 feet of shedding, showing an increase of 7357 feet over Bristol last year, and 11,154 feet over Cardiff seven years ago. This will give some idea of the enormous traffic, over all parts of the ground, which had to take place before all the implements, machinery, and other articles could be deposited in their various stands, and no one who saw the ground afterwards would under-estimate the difficulties that had to be contended against.

In the first instance sleeper-roads had been made for short distances from each entrance, but when some of the heavier machinery began to come in and the ground to be cut up, to become shortly a sea of mud, in many cases knee deep, it was found to be absolutely necessary, if the remainder of the exhibits were to be got in at all, for the sleeper-roads to be continued down the whole of the main avenues, seven in number; and as this work could only be done during the time that other traffic was stopped, men and horses had to be kept at work for days up to ten and eleven o'clock at night, and from daybreak in the morning, which was then about three o'clock; and manfully they stuck to it—many of the men having been employed

both night and day for three or four consecutive days, and often in pouring rains. By this means, however, most of the implements were got into the yard before the opening of the Show on Monday, June 30, though much of the machinery in motion was not got into working order until the middle of the week.

It was then necessary to provide, in some way or other, for the convenience of the public, to enable them to get to the different stands, and for this purpose several thousand feet of planks and, I may say, miles of wattled hurdles were laid down, which to some extent attained the desired object, for although the latter were rather rough to walk upon, they were certainly preferable to wading ankle deep in the mud.

The extra cost entailed on the Society by the weather alone in labour and materials was upwards of 4000*l.*, the loss on the part of the exhibitors being, of course, incalculable; but the loss most to be regretted was that sustained by the public, who were utterly unable to see or appreciate in any satisfactory degree an exhibition so full of interest and instruction, and such a one as this generation is not likely, in this country at least, to have the opportunity of visiting again.

I think, therefore, that the Exhibition of Implements at the International Show at Kilburn will long be remembered by those who took part in it, both officials and exhibitors, for the difficulties that had to be overcome, and the utter discomfort that prevailed during the whole of the meeting. For my own part, though regretting the loss entailed both on the Society and the exhibitors, I cannot look back at the Show with feelings altogether unmixed with pleasure, when I remember the indomitable pluck and good humour displayed on all sides, and the thorough determination of everybody to make the best of a bad job, for disappointing it was, heart-rending, I may almost say, to be unable to reap the benefit of so splendid a collection brought together at so much labour and cost.

There is no doubt that the Exhibition of Implements this year was exceptionally large, partly owing to its international character, and also, it may be, to the large stocks in the hands of many exhibitors from the long depression affecting all trades alike, more especially agriculture. But to me it is a question, which I think will have to be seriously considered, whether our show in this department has not grown to such an extent that it must be curtailed in some way or other. There can be no doubt that one on a smaller scale would be of more utility to the public; and this result can only be arrived at by a more thorough weeding out of articles of a miscellaneous character, and, as Mr. Hemsley suggested last year, the regulation as to duplicates being more strictly enforced. I do not for a

moment suggest that our Annual Show or occasional trials be done away with, for I believe that as much good may be done in the future as has been done in the past; but as other fields of usefulness are continually opening out to the Society, some alteration must be made in one way or another, and this appears to me to be the part where the pruning-knife may be most advantageously applied, and our Exhibition will still remain as useful as it is at the present time, if not more so.

Of any individual part of the Exhibition there is no necessity for me to write, as that will be very ably done by Mr. Coleman. I will therefore conclude my Report by thanking my colleagues and all with whom I have been officially engaged for their kind and valuable assistance rendered to me during my four years of office.

XXIX.—*Report on the Exhibition of Implements; Award of Medals, &c., at the International Exhibition at Kilburn.* By JOHN COLEMAN, of Riccall Hall, York.

ADVERSITY is a good schoolmaster, and the bitter experiences of Kilburn will not be thrown away upon the executive of our great, and I am glad to say, rapidly increasing National Society. It is something amidst the disappointments and disasters attending this noble effort to know that the member-roll has been increased by nearly a thousand; a gain which in the long run will counterbalance, aye, and outweigh the present sacrifice, undeniably heavy as it must be. The retiring Steward, Mr. G. H. Sanday, has given the readers of the 'Journal' his valuable notes as to the causes of the unfortunate result of the International Meeting. It remains for me to state for myself and the Judges who worked under him, our unbounded admiration of the untiring energy and earnest zeal which has characterised his tenure of office; his invariable courtesy and good temper in the midst of complications and difficulties which might well have excused some irritation. His conduct as a Steward of Implements has fully justified his selection as a Member of the Council, and has endeared him to all with whom he has co-operated. In saying this much of the retiring Steward, I do not overlook our obligations to his colleagues, who one and all worked splendidly in the face of difficulties which at one time seemed overwhelming. It is the hour of trial that tests the quality and resources of men, and one of the compensating elements in the load of troubles at Kilburn, was the splendid way in which the officials, from the Steward of General

Arrangements downwards, not forgetting the energetic Secretary, faced the situation, and did all in the power of mortals to avoid disaster. One of the lessons that has been learnt is the advisability of having a well-made road along the main avenue,—a precaution which was sometimes formerly adopted, at least I am certain that such a road was made for the Leeds Show in 1861, because remains of it proved of great value to the Yorkshire Agricultural Society, whose Show subsequently occupied the same site. At Kilburn this deficiency was partly met by the train service provided by Messrs. J. Fowler and Co., of Leeds, who used Decauville's portable railway, and realised a handsome profit by running frequent trains to and from the main entrance to the Kensal Green end at twopenny fares. This afforded a great convenience to the public, and a convincing proof of the practical nature of the apparatus, notwithstanding the extremely soft nature of the ground, which caused the rails to sink up and down, and the train to behave at times like a boat on the water. Throughout, the gauge was maintained, and the engine never once ran off the rails. Some further notice of this useful appliance will be found at the end of my Report. Another point, that must have been evident to the authorities, is the necessity for having a properly constructed plank road, made along or against the outside of the ground, on which all heavy machinery could be conveyed to its destination. No amount of precautions could have met the extraordinary difficulties resulting from the constant wet on such a soft soil as Kilburn, but much of the frightful strain upon horses and vehicles might possibly have been avoided.

A word to exhibitors will, I trust, be received in the same spirit in which it is given. They were in too many instances heavy sufferers, because the state of the ground prevented visitors even reaching their stands at all, and certainly from making a careful inspection of their exhibits. It would add greatly to the comfort of the public, facilitate their movements and opportunities of seeing the implements, and would ensure a much greater share of attention to the exhibits, if the latter were generally so arranged as to allow of a promenade space down the centre of the shedding. The visitor could then pursue his or her way in comfort, and protected from the rain, instead of having to paddle along under the drip of the eaves and exposed to all the fury of the elements. The plan is already pursued by some of the leading firms, but I think there are few cases in which it might not be adopted, although it would probably necessitate the taking of more space or the limiting of entries.

As regards the general character of the Implement exhibition, I think those (unfortunately too few) who persevered through

mire and mud, and really saw the Show, will agree with me as to its surpassing excellence, though they may have wished for their own comfort that it had been smaller. 11,878 articles, distributed through 704 stands, required more time to look over than most people have at their disposal, and the Judges, Messrs. Barral, Kimber, and Cranfield, assisted by Mr. Anderson and Mr. Rich, deserve all praise for the untiring industry they displayed in mastering the details of such a vast and varied display. Some disappointment was felt at the comparatively small and unimportant nature of the foreign exhibits, yet even here there were valuable lessons to be learnt. The Dairy Appliances, as seen in the International Dairy, and especially the, to us, entirely new invention for separating cream from milk by centrifugal force, were interesting and instructive. The apparatus for hatching, rearing, and feeding poultry, indicated an industry in France which it will be a disgrace to us if we fail to imitate and improve upon.

It will be seen by the Judges' selection, that the excellence of the English exhibits consisted not so much in the presence of actual novelties, which were few, as in the improvement and development of machinery already introduced. So lively, however, is the enterprise in the line of self-binding mechanism for reaping machines, an enterprise fostered and developed by the efforts of the Society, so numerous were the different inventions, and so impossible to judge of merit without thorough trials, that the Judges wisely decided to abstain from any notice, trusting that the Society would see fit to make them the subject of special trials at the Carlisle Meeting. It would therefore be premature to pass any opinion, and I limit myself to saying that the problem of an effectual string-binder seems in a fair way of solution.

The remarks made by Mr. John Hemsley and myself in the Reports of the Bristol Meeting touching the work of Miscellaneous Judges, and the award of Silver Medals, has resulted in important modifications, which there is reason to think will prove advantageous to the public and to the exhibitors. It is especially important that so valuable a distinction should not be awarded to a novelty until the same has been subjected to a thoroughly searching trial. The following regulations were issued by the Council:—

SILVER MEDALS.

1. There are Ten Silver Medals, the award of which the Judges appointed by the Council have the power of recommending in cases of sufficient merit in New Implements exhibited at the London Exhibition.

2. These Medals cannot *in any case* be awarded to any implement, unless the principle of the implement, or of the improvement of it, be entirely new. No Medal shall be awarded by the Judges without the consent of the Stewards, and no Commendation of Miscellaneous Articles shall be made by the Judges.

3. The Judges are also empowered to make special awards of Medals for efficient modes of guarding or shielding machinery, especially when worked by steam, from contact with persons immediately engaged in attending to such machinery while at work.

4. No Medal shall, in any case, be awarded to any Implement or Miscellaneous Article capable of Trial until it has been subjected to such Trial as the Stewards may direct.

The following were awarded Silver Medals :—

No. in Catalogue.

10,347 to 10,352. Messrs. A. Ransome and Co., for Machinery for making Butter Firkins.

291. Messrs. Samuelson and Co., for Patent Hay Press.

365. Messrs. McKenzie and Sons, for Gorse Masticator.

Messrs. Carter and Co., High Holborn ; Messrs. Little and Ballantyne, Carlisle ; Messrs. Paul and Son, Cheshunt ; Messrs. W. Paul and Son, Waltham Cross ; and Messrs. W. Cutbush and Son, Highgate, for their efforts, under the unfavourable circumstances of the weather, to decorate the railway embankment projecting into the Exhibition grounds.

The Aylesbury Dairy Company, for their exhibition of Dairy Appliances at work in the International Dairy.

M. G. De Laval, for Swedish Cream Separator.

Messrs. A. Ransome and Co., of Stanley Works, Chelsea, were awarded a Silver Medal for Machinery for making Butter-firkins, both on account of the great saving in cost over hand labour, and of the superior character of the work. Mr. Allender, the Managing Director of the Aylesbury Dairy Company, considers that the use of these casks over the ordinary Irish butter-tubs will result in the saving of at least 1 lb. of butter each journey, which wastes away between the staves, to say nothing of the better preservation of the butter when protected from dirt and oxidation. The five machines required for the process, together with a vertical engine and boiler, cost 345*l.* ; and Mr. Ransome states that with unskilled labour, principally boys, such a set of machines can turn out 1600 casks a week, at a cost of $2\frac{1}{2}d.$ each for labour, as against 9*d.* by hand labour. The only work done by hand is the fitting in of the dowells, and the closing of the two portions which form the head, the fitting in of the heads and the hooping with split hazel-rods ; and it is a fact worth noticing, that these operations occupy more time than all the other series together. Any wood can be used ; oak and beech for preference. At Kilburn, white poplar staves were employed. It would be beyond the scope of my Report to enter into a detailed description of the admirable machinery that has been invented by Messrs. Ransome to effect the object. Those who are desirous of further information will find a very clear and well illustrated report in the number of 'Engineering' for June 27th, 1879. I may, however, just name the various machines, with their respective uses. It should be understood that

the machinery is intended to deal with sawn staves, which are now generally employed, although if riven staves are fairly straight and equal as to thickness, they can be worked; but the figures given refer to sawn staves. It must be further understood that the material is planed on that side which is to form the inside of the keg. The outside is left rough, as there is no object in having it smooth. The stave-jointing machine is constructed with two discs of conical section, each fitted with four cutting-knives, and revolving at a high velocity. The stave is secured by a cramp at each end to a plate pivoted to the arms of a swinging frame, which allows of the angle of the edge of the stave being altered to suit its width and the nature of the required joint. It is evident that as the staves are of different widths, a varying amount of stuff has to be removed from each end. The adjustment for this purpose is obtained by means of a hand-wheel and screw. This is a very efficient machine, and can be worked by two lads, who can prepare the staves for a firkin in two minutes. The staves are next laid for a few minutes on a hot plate, in order that they may be rendered sufficiently flexible for the operation of trussing. The plate is heated by a coke fire underneath, and is marked so as to give the outside circumference of the cask; and it is the duty of the lad who warms the staves to see that he has sufficient staves for each keg.

The trussing machine is very ingenious. It comprises a bell-shaped casting in two sections, one of which can be opened outwards on a hinge, and can be secured by a hand-wheel and clamping screw. Three trussing hoops of iron lie in grooves on the inside of the casting. Underneath the cone is an iron table, which can be raised and lowered by a screw. The hoops being fixed in the bell, another is placed on the table, and a set of staves hot from the stove are placed with their lower ends resting in the hoops, and the upper on the bottom portion of the cone. The table is made to rise, bringing the staves tightly together and forcing them into the truss hoops. The lad, with a hammer, watches the settling of the staves into their places, and taps them back as required. The bell is now opened, the table run down, and the cask reversed, when the other end is submitted to a similar process, and the operation of trussing is completed. The control of the screw by means of a friction clutch is very perfect. One lad can truss 30 casks per hour.

The cask is next placed in the chiming, crozing, and dowelling machine, by which both ends are cut to length, and the operations for preparing the cask to receive the head and bottom are completed. All this is done so rapidly, that 80 tubs are finished per hour. The cask is now ready for heading and hooping. The next machine deals with the heads; these are

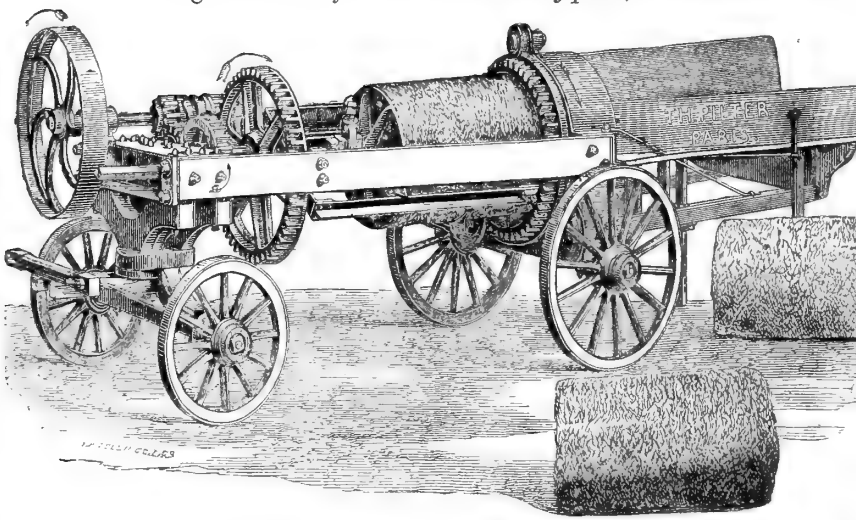
made of two pieces, which have to be jointed. The machine consists of a disc, and of two augurs carried on a frame just above the disc; as soon as the sides are jointed, the holes are bored, the dowels are fitted by hand, and the head is ready for the next operation; one lad can join and bore the wood for 1000 heads in ten hours. The head-turning machine is very ingenious. The square head is clamped between flat circular plates, which are capable of being rotated; as soon as the saw has cut through the wood, the plates rotate, and thus the concave saw rounds the head, and gives the required bevel to the upper side, while the bottom bevel is obtained by two flat cutters mounted on a block underneath the saw; the heads for two casks can be cut in a minute. Such is a very brief description of the very admirable machinery exhibited at Kilburn, and which was very properly recognised by the Miscellaneous Judges. It may be mentioned that this particular set had been sold to a fish-preserving company at Boulogne for the manufacture of fish barrels.

It is also worth notice, that the Aylesbury Dairy Company purchased all the firkins made during the Show. Though not guaranteed to be watertight, so close are the joints, that practically the casks become so from the moisture exuding from the butter. One was tested with water, and, though it dropped for a few seconds, it very soon swelled and became perfectly water-tight.

A Silver Medal was awarded to *Messrs. Samuelson and Co.* as the exhibitors of Mr. T. Pilter's Patent Cylindrical Hay-press, which was shown last year at the Paris Exhibition, and which has much merit to recommend it. Mr. Pilter is an Englishman who has carried on an agency business in Paris for America and England during a number of years. The advantages claimed for this invention are rapidity of action, handier form of bale for moving about, absolute uniformity of material, and impossibility of packing the bale. The apparatus being on wheels is easily moved, the total weight being about two tons. Reference to the illustration (Fig. 1, p. 694) will enable the reader to understand the following description:—The hay is forked by two men upon the platform, which is separated by a central division, so as to ensure a regularity of feed on either side. The bottom of the platform is composed of slatted openings, through which a chain feeder draws the hay to the mouth of the press. The hay is sucked in between two conical rollers, placed horizontally. The hay thus brought against the end of the press assumes a centrifugal motion corresponding to that of the press, and thus winds itself into a compact mass, gradually forcing back the press and overcoming a slight pressure given by two wooden

friction blocks acting on the rod of the press,—the amount of which friction can be regulated by a screw. When sufficient hay has been introduced to make a bale, the revolving action is stopped, and the pressure is brought to bear by means of a powerful screw, which forces the press and the hay against the mouth. When a proper degree of pressure has been produced, two wires are inserted longitudinally, and secured by clips. The bale is now bound, and it only remains to draw back the press, when the bale drops down into the space under the machine, and can be rolled away. The bale thus made is a solid uniform cylinder, 2 ft. $1\frac{1}{2}$ in. in diameter, and weighing about $2\frac{1}{4}$ cwt. The pressure applied is about 6 cwt. to the cubic yard, but this can be increased or diminished at will.

Fig. 1.—*View of Mr. T. Pilter's Hay-press, No.* 291.

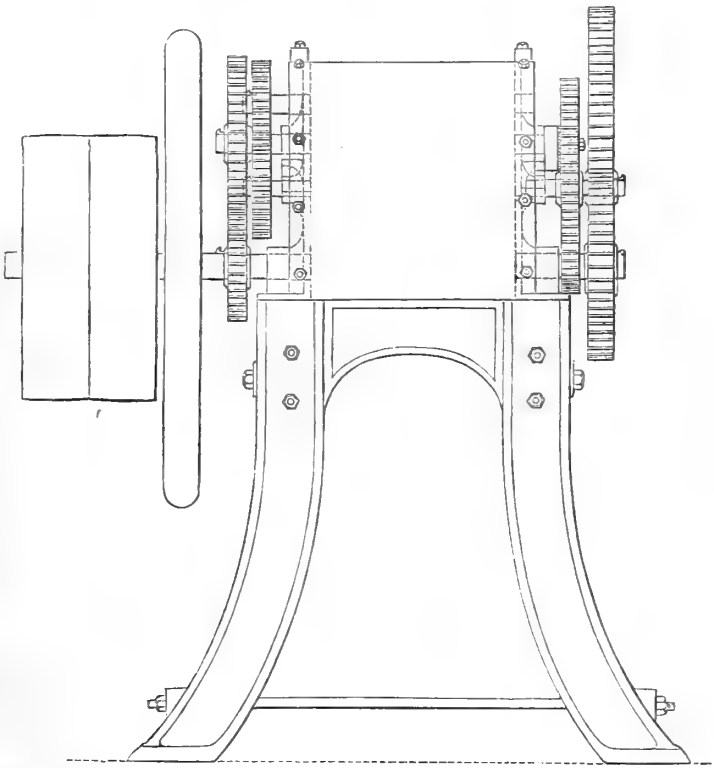


The machine can be worked by a four horse-power engine, and three men can make a bale in about five minutes. The Judges proved this by actual experiment; and it may be remarked that the Boomer Press, which is the most powerful and efficient of the American inventions, takes quite double the time to bale the same quantity of hay. The price of the machine is 105*l.*

Messrs. McKenzie and Sons Limited, of Camden Quay, and Ceres Iron Works, Cork, Ireland, were awarded a Silver Medal for their Furze or Gorse Masticator, a machine which appears capable of really reducing this valuable material into an edible condition, and a further advantage is, that the machine can be used to kibble beans and maize. Many attempts have been made

in this direction. Messrs. Barett and Exall, of Reading, now the Reading Iron Works Co., Limited, brought out a machine more than a quarter of a century ago, but neither this nor any subsequent invention has proved quite successful, inasmuch as the juice from the gorse had a tendency to clog the rollers through which the gorse has to pass in order to be pulped. This is prevented in McKenzie's invention by a series of scrapers hung upon a bar under the masticating rollers, and held to their work on the smooth surface of the rollers by an adjustable rocking-

Fig. 2.—*Front view of McKenzie's Gorse Mill.*



bar. The machine, as will be gathered from the illustration (Fig. 2), resembles an ordinary chaff-cutter with the mouth covered by a shield. The gorse is fed in by means of a feeding-box and feed-rollers, and is brought up to the face of the box, which is made of steel; against this face revolves the cutting apparatus, which comprises two knives curved and fastened to two wheels, $6\frac{1}{4}$ in. diameter, on the shaft. The steel face plate

is adjustable, and is arranged with a slight upward pitch. The material as cut by the knives falls upon the masticating rollers. These comprise a series of serrated discs, No. 11 wire gauge, with saw teeth alternating with plain surfaces, the discs being about $\frac{3}{4}$ in. larger diameter than the plain surfaces. The discs of one roller revolve close to the plain surfaces of the other, *i.e.* within about the $\frac{1}{32}$nd of an inch.

Fig. 3.—*Side view of McKenzie's Gorse Mill, showing gearing.*

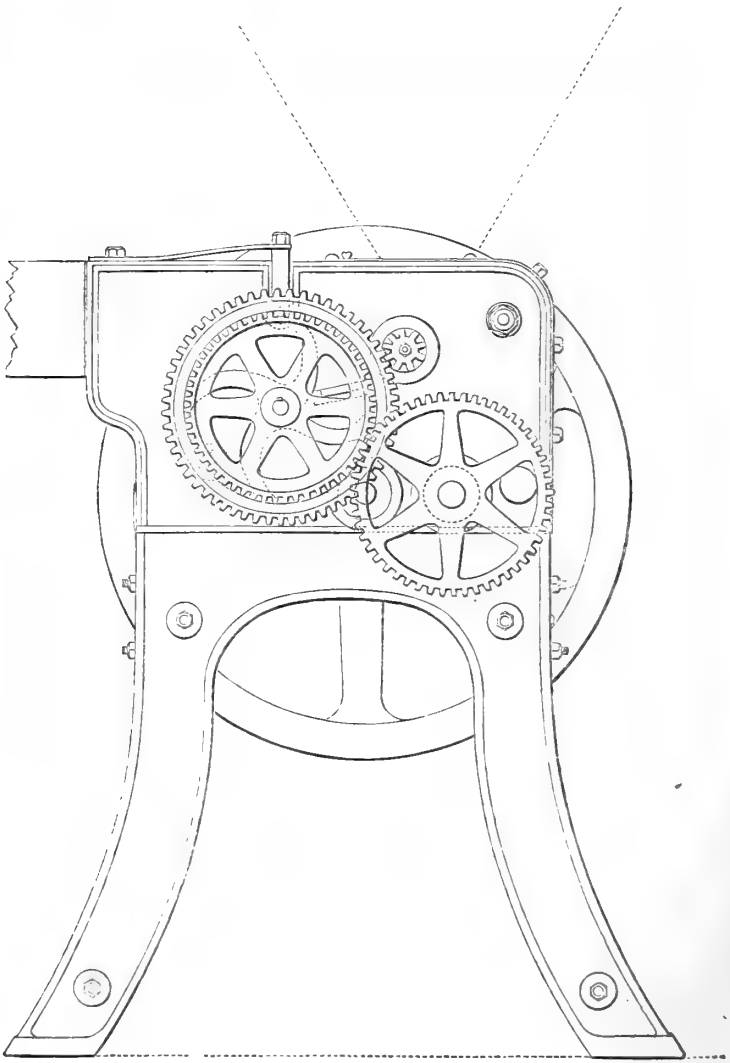


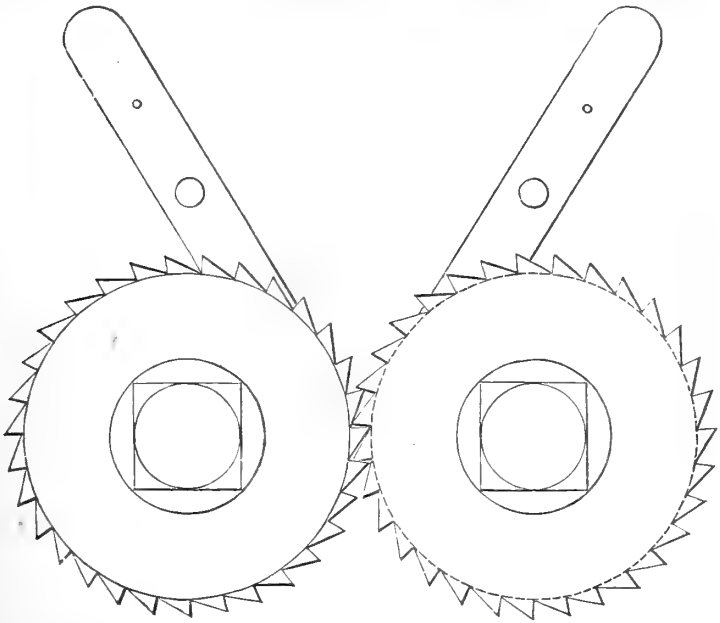
Fig. 2 (p. 695) gives a front view of the machine, showing driving pulleys, main shaft, gearing, &c.

The main driving shaft carries the front masticating roller, 5 in. in diameter, which revolves 300 times per minute. The second roller is driven from the first by ordinary cog-wheel gearing. The speed of the knife shaft is reduced to 134 revolutions by gearing on the right-hand side by the fly-wheel.

Fig. 3 (p. 696) shows the gearing on the opposite side to the fly-wheel. A small pinion reduces the speed of the bottom feed-roller to 24, which drives the top roller to the same speed. On the shaft of the lower roller is a gear-wheel, which actuates a second wheel, which drives the front masticator at 22 revolutions per minute.

Fig. 4 shows a section of the masticators.

Fig. 4.—*Section of the Masticators of McKenzie's Gorse Mill.*



The Judges organised a trial with 23 lbs. of very coarse strong gorse. The time occupied was $3\frac{1}{2}$ minutes, the machine running at about 380 revolutions per minute, and driven by an 8 H.-P. engine with 13 lbs. steam in the cylinder—actually about $2\frac{1}{2}$ H.-P. employed. 6·60 lbs. of gorse was crushed per minute. I think that with more power a greater result could be obtained, and it is, I think, fair to assume that about 2 tons per day could be masticated. The work was done well, and there is little doubt that this machine will supply a great want where gorse is used as cattle food. The price of the machine tested, which has a 11-in. box, is 15*l.* 15*s.*

The Society were under considerable obligations to certain seedsmen for their enterprise in utilising and embellishing the railway embankment which projected into the grounds, and would otherwise have been a very unsightly object. Foremost in this good work were *Messrs. Carter and Co.*, of High Holborn, who occupied several hundred feet of ground with their grass seeds, similar to those used in Paris. Though only sown at the end of May, so rapid and uniform had been the growth, and so unremitting the attention, that the surface was entirely covered, and the appearance was that of a well established turf. The effect of these various plots of bright green, separated by well-arranged plants, was very striking, and reflected great credit upon the taste and enterprise of that world-renowned firm. *Messrs. Little and Ballantyne*, of Carlisle, a firm which have not hitherto been exhibitors at the Royal Shows, but were probably stimulated to exert themselves as conspicuously and successfully as they did by the desire to become better known to the habitués of the Shows before the Meeting of 1880—when being at home they will doubtless make a great display—occupied a considerable space, and showed an admirable collection of coniferous plants, including most of the pine tribe worth growing in this country, whether for timber or ornament, from the elegant junipers and retinosporas of China and Japan, to the gigantic pines, cypresses, and cedars of Himalaya and California. The arrangement was very good. In a series of circles and half-circles, each genus had its typical representative in the shape of a well-grown tree in the centre of the bed, whilst around it were grouped the species and varieties belonging to the family. The effect of this grouping, due care being exercised as to the variety of hue, was very striking as well as instructive. Golden yews, junipers, cypresses, arbor-vitæ, and retinosporas, vied with each other in varied forms and hues, and made a very pretty display. One bed was devoted to miscellaneous plants of recent introduction, including the *Osmanthus ulicifolia variegata*, a holly-leaved shrub from Japan; *Coprisma bameana*, a hardy variegated-leaved shrub; a novel tricolour-beech; a black-leaved oak and birch; and the weeping Wellingtonia—all of which Messrs. Little and Ballantyne have been instrumental in introducing. They also, like Messrs. Carter and Co., had devoted a portion of the ground to grass seeds, which looked well.

Messrs. Paul and Son, of Cheshunt, occupied a considerable space with artistically arranged beds of tricoloured geraniums, their brilliant foliage adding much to the effect. They had a varied and numerous collection of cedars and deodars, and splendid cut roses, for which this firm have long enjoyed notoriety.

Messrs. W. Paul and Son, of the Waltham Cross Nurseries, occupied a space of 100 feet by 30 feet, on the side of the embankment, which was covered with a collection of hardy evergreens and conifers, including Weymouth, silver, Scotch, and other pines; several varieties of *Cupressus Lawsoniana;* the different kinds of hollies, yews, and retinospora, *Cedrus deodara*, and Lebanon cedars, junipers, piceas, abris, &c. At the foot of the bank were groups of variegated-leaved geraniums, and at the upper part of the embankment they had boxes of cut blooms of roses, pæonies, rhododendrons, and clematis.

Messrs. W. Cutbush and Son, of Highgate, who occupied a similar area, had as their speciality a very fine collection of bays in tubs, also variegated hollies; thirty to forty different varieties of ivy; many enticingly pretty specimens of conifers; a 15-feet araucaria, and a miscellaneous collection of evergreen trees and shrubs.

To the above-named five exhibitors, viz., to Messrs. Carter and Co., High Holborn; Messrs. Little and Ballantyne, Carlisle; Messrs. Paul and Son, Cheshunt; Messrs. W. Paul and Son, Waltham Cross, and Messrs. W. Cutbush and Son, Highgate, Silver Medals were awarded for their efforts, under the unfavourable circumstances of the weather, to decorate the railway embankment projecting into the Exhibition grounds,—a recognition of their desire to contribute to the success of the Show which I have every reason to believe was highly appreciated.

The International Dairy.

The Society, after the great interest evinced at the Dairy trials at Bristol last year, were anxious to have as an integral feature of their Cosmopolitan Show, a representation of the various processes which distinguish the different dairy interests. For example, it was originally intended to secure experts in cheese making from the Cheddar, Cheshire, and Gloucestershire districts; difficulties, however, cropped up, and it was when the practical issue was imperilled that the Aylesbury Dairy Company, through their able and energetic Managing Director, came to the rescue, and offered to illustrate the leading processes, and exhibit the more prominent inventions, the Society finding the engine and show room. Of all the interesting features of the great Kilburn Show, none was more popular or attracted more attention than the operations continually in process at the International Dairy, and it would have added much to their value if a popular explanation had been given at intervals during each day. This enterprise on the part of the Company would

undoubtedly have proved advantageous to themselves under favourable circumstances, but, nevertheless, it deserved recognition at the hands of the Society, and it was therefore very right that a Silver Medal should be awarded. Before I attempt to describe the various exhibits, a word or two as to the Company itself may not be out of place. The Company was started in 1866, and commencing at first on a small scale, has, by the supply of a genuine article at a fair price, become by far the most important medium that exists between the producer and consumer. In addition to the handsome and extensive premises at St. Petersburg Place, Bayswater, the Company have two branches at Lowndes Street and Grosvenor Road, N.; cowsheds at Portobello Road, Notting Hill, and cheese factories and piggeries at Swindon. The results of this enterprise may be gathered from the following figures:—

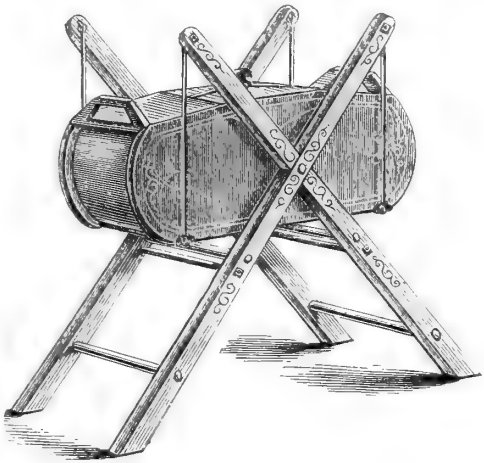
In 1875, milk sold to private families was			262,535	gallons.
„ 1876	„	„	267,788	„
„ 1877	„	„	347,080	„
„ 1878	„	„	476,027	„

The great increase of sale in 1877 was due to the fact that Government inspection and analysis was instituted in that year, and the value of a good article was evidently appreciated. From the commencement of the Company's business, every can of milk has been tested, and frequent analyses have been made. About three years ago, when so many outbreaks of typhoid and other diseases were found to be caused by a contaminated milk supply, the Company determined to adopt an entirely new and thorough system of inspection. The services of a well-known medical man, Mr. Ernest Hart, who has given great attention to all sanitary questions, and of Mr. W. Eassie, C.E., were retained, and now, not only are all farms from which the Company obtain supplies inspected, but a plan of the buildings is taken and lodged at the Company's office. If there is anything defective in the drainage or water supply, such defects must be remedied before the produce from that farm is distributed to the public. The servants of the Company in London, through whom the milk is supplied to the public, are lodged in substantial blocks of barracks, specially built for this purpose, with all proper sanitary appliances, and these are under medical supervision. These precautions have been carried out at an outlay of 10,000*l.*, and an annual cost for fees, &c., of 1000*l.*

A short description of the exhibits must suffice, and first, in reference to butter. Churns by Thomas and Taylor, of Stockport (of the same pattern as that which gained first prize at

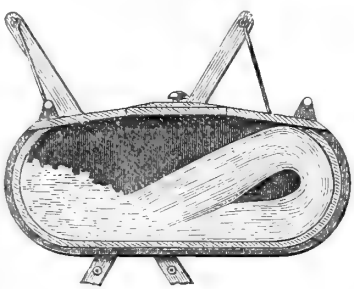
Bristol last year); by Bradford and Co., of Salford, similar to the highly commended churn at Bristol, but improved in the dasher, and fitted with pulleys for running at two speeds; and Davis's American Swing Churn, made by the Vermont Farm Machine Co., Vermont, U.S., which, as regards this country, is a complete novelty, although something of the same sort was shown at the Philadelphia Centennial Exhibition, by G. T. Elsworth, of Baine, Massachussetts, and noticed in my Report.*

Fig. 5.—*View of Davis's American Swing Churn.*



This churn consists of a rectangular box with circular ends, suspended by iron rods from an ordinary double X frame. The interior of the box is entirely clear of mechanism, and the necessary agitation is produced by the gentle motion of the box backwards and forwards, which causes the cream to be thrown first against one end and then against the opposite. The appearance of the churn and its action will be understood by the subjoined view and section (Figs. 5 and 6).

Fig. 6.—*Section of Davis's American Swing Churn.*



The advantages of this churn for use in small dairies consist in its cheapness, simplicity, freedom from mechanical details,

* 'Journal of the Royal Agricultural Society,' 2nd Series, vol. xiv. p. 82, 1877.

ease with which it can be worked—a child's strength being sufficient *—and facility with which it is emptied and cleaned.

Butter Workers are quite recent introductions, for which we are undoubtedly indebted to our transatlantic friends, although it was a German, Mr. Ahlborn, who first exhibited these valuable machines at the Bristol Meeting, when he obtained the prizes for two forms suitable for large and small dairies. Previous to this, indeed soon after the Philadelphia Exhibition, I was consulted by Mr. Allender as to the novelties there, and I strongly recommended the Butter Worker invented by P. Embree and Son, of West Chester, Philadelphia, of which Ahlborn's machine is a close imitation. This was accordingly purchased, and formed a part of the exhibit of the Aylesbury Company. It has already been so fully described, that I need only state that the butter is placed on a revolving table with a convex surface. The butter placed on this table as it comes from the churn, is pressed by a revolving conical fluted roller; the axis of this roller has a bevel wheel which, working in the gearing placed in the centre of the table, causes the butter to revolve. This is very simple and efficient; the edges of the flutings are sharp, and so press almost through the butter, more or less cutting it up, and thus very thoroughly express the moisture, which collects in a channel round the outside of the table, and passes away by an opening. Both the Davis's Swing Churn and the Embree Butter Worker are now being made for the Aylesbury Dairy Company, by Messrs. Bradford, of Manchester, as they have recently decided, on account of numerous applications, to supply all descriptions of dairy fittings, &c.

Lawrence's Refrigerator, which, originally invented for brewing purposes, is found admirably adapted for rapidly reducing the temperature of milk and preparing it for transportation, is so well known as to require no explanation; its efficiency and simplicity are undeniable.

A great novelty as regards this country was the Cooley Creamer, manufactured by the Vermont Farm Machinery Company, and sold by their English agents, Messrs. Neel, Son, and Anderson, of 91, Watling Street, London. It comprises a water-tight box, resembling in external form a domestic refrigerator, only that it has inlet and outlet pipes, and a thermometer let into the front, so that the temperature of the water can be readily seen. The cans which are used are 20 inches deep, and 8½ in diameter, and have covers, which, when fastened down, prevent the access of moisture. The milk is thus set under water, the oxidising action

* Further trials have not confirmed this opinion, for although when empty the churn can be worked by a child, yet when duly charged it requires more power than might be inferred without a practical test.—Ed.

of the air is prevented, and the milk is preserved from impurities that may exist in the atmosphere. It is said that if the temperature of the water be kept at from 45° to 55° in spring and summer, and from 40° to 50° in winter, the cream will rise in twelve hours, and thus sweet cream and sweet milk can be secured, and a uniform quality of butter, even through hot weather. It should be clearly understood that the covers do not fit down closely on the cans, being prevented from doing so by cleets fastened inside the covers, raising them up half an inch, from the top of the cans, thus securing a free circulation from the milk into the water through the air confined under the cover; at the same time the water seals the milk from contact with the atmosphere. The cooling of the milk from 80 to 90 degrees, to from 45 to 55 degrees, affords an excellent opportunity for clearing off animal odours and gases. The boxes are made in various sizes, from Creamer No. 0, suitable for a single can, 3*l.* 12*s.*, to No. 6, 28 × 84, and which holds 12 cans, and costs 15*l.* In England, we have no experience of this new system, which, however, looks reasonable, and, according to testimonials, it has been largely and successfully employed. Mr. Allender, however, considers that for working on a large scale the Cooley Creamers will not be of much use; for small dairies they are very useful, but for large dairies the Swartz system is the best.

The Aylesbury Company also exhibited deep-setting cans on Swartz's system, which were so successful last year, and certainly, until the appearance of the Cooley Creamer, gave the best results; as also two railway cans, for 10 and 17 gallons, of the same pattern as those which won the prize of 10*l.* offered by the Society of Arts. All the above machines were used by the Company for butter-making.

The Cheese Dairy was represented by Cheese-making apparatus by Cluett, of Tarporley, Cheshire, fitted for steam, the vat being similar to that which gained the first prize at Bristol last year. Also a circular cheese vat by Wilkins, of Calne, Cheshire; curd mill and double cheese-presses by Cluett; tripod presses by Carson and Toone; milk pails and small tins for setting; these latter being of a novel description and made by a new process by the Anglo-American Tin Manufacturing Company of Stourport. They are very light, have a beautifully smooth surface, and are seamless.

The Company had a large staff of attendants, lads and women; and throughout the Show, butter and cheese making were illustrated. As I before remarked, it might have added materially to the value of the work if the on-lookers could have been made acquainted by a short description. The Company

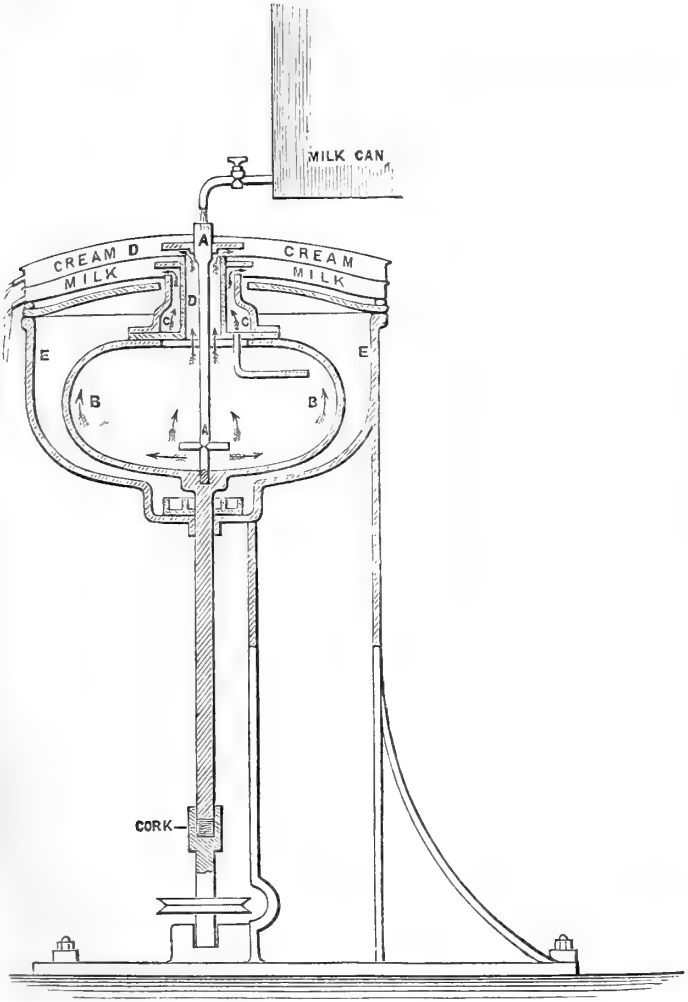
took the prize for cream cheese, and not only made and sold these, but also another variety of soft cheese.

Mr. *Edward Ahlborn*, of Hildesheim, Hanover, exhibited a number of his well-known vertical churns, one of which gained the first prize last year as the best churn for obtaining butter from fresh milk; a cheese vat and apparatus for making Dutch cheese; Limbush's curd drainer for separating the portion of curd left in the whey, and which is used for making Limburg soft cheese, whilst the bulk of the curd is made into the ordinary round Dutch cheese; butter workers, very much on the same principle as the Embree machine, but the flutings of the roller are less sharp, as Mr. Ahlborn does not consider it necessary or desirable to cut the butter so much. The gearing is less simple, though, possibly, it works rather lighter. Mr. Ahlborn also exhibited deep-setting cans on the Swartz principle, which, with a supply of cold water and the addition of ice in hot weather, are undoubtedly valuable improvements for obtaining sweet cream. Mr. Ahlborn has provided a lid for the vat, so as to prevent dust, &c., reaching the milk. As has been seen, the Cooley Creamer is a still further development of the Swartz system. As Mr. Ahlborn's exhibit received, in company with other foreign displays, honourable mention, I may here notice a very beautiful model of a dairy in compartments, illustrating the various processes carried on. The only other exhibit in the International Dairy building was a large power barrel-churn shown by Mons. *Le Sueur*, and invented by Mons. Canou Touellin, of 45, Rue St. Patrie, Bayeaux. This carries three fixed beaters $3\frac{1}{2}$ inches deep, and fixed 3 inches clear of the sides. This is a strong, well-made oak churn, with four hoops, and is driven by clutch gearing.

The most novel as well as the most interesting exhibit in the International Dairy was Mr. G. de Laval's (of Stockholm) Centrifuge, or cream separator, which was exhibited by *Mr. E. Hore*, Great Winchester Street, London, who is the English agent. Although an absolute novelty here, Centrifuges have been known for some time both in Germany and Denmark, and in the latter country important experiments have been carried out, which prove not only their efficiency, but the practical value which attaches to the instantaneous separation of the cream, over the ordinary process of setting. In both cases the separation is the result of gravitation. The cream globules being of less density than the watery parts, rise to the surface. The action of this machine is to expedite the process by submitting the milk to rapid centrifugal motion, which causes the heavier ingredients to be thrown to the outside of the circle,

whilst the cream occupies a more central position close round the axis of rotation. For the following admirable illustration and description I am indebted to Mr. F. S. Courtnay, assistant to Messrs. Eastons and Anderson, for whose hearty assistance in my difficult task I desire thus publicly to express my grateful thanks.

Fig. 7.—*Section of Mr. de Laval's Centrifugal Cream Separator.*



The milk, as it comes from the cow, is placed in a milk can, and delivered by means of an ordinary tap into the top of a

hollow tube (A), which terminates in a T-outlet near the bottom of a spherical vessel of about 10 inches in diameter, which, encased in a cast-iron casing, (E) rotates at a very high velocity, viz., 6000 or 7000 revolutions per minute. An instantaneous separation takes place. The heavier portion, which represents what we ordinarily term skim milk, is thrown to the outside of the vessel, and forced up a bent perforated pipe which communicates with the open space (C), whence the milk is delivered into the lower of two block-tin trays or covers, which is provided with an outlet pipe. The rapidity with which the milk enters the Centrifuge must be regulated according to the velocity at which it is driven: the greater the speed the more rapid the separation. The cream remains near the centre, rises round the outside of the inlet pipe, and delivers itself into the upper tin tray (D), where it is discharged through an outlet pipe. The rotating vessel and shaft are of forged steel, in one piece, tested by a pressure of 250 atmospheres. The shaft rests upon a cork pad, inserted in the driving spindle. In the event of the power being cut off by the strap breaking, or any other cause, the vessel will continue to rotate for a considerable time. The arrangement for securing a supply of oil to the working parts is ingenious and effective; and generally, both as regards construction and detail, the machine has been carefully worked out. A trial was made in the following manner: Sixty gallons of milk were placed in one of the cisterns of the Aylesbury Dairy Company, thoroughly agitated to ensure uniformity of quality, and divided into equal portions by taking gallon against gallon. Half the milk, viz., 30 gallons, was at once set according to Swartz's system, i. e., in deep tin cans, surrounded by ice and water; each can was covered over with paper, and securely tied and sealed, so as to prevent any tampering with the contents. The other half was passed through the Centrifuge, and the cream was then churned in the Oscillating Churn of the Vermont Company, yielding exactly 10 lbs. 3 oz. After setting for twenty hours, the Swartz's vessels were skimmed and the cream churned in the same churn: the result was 10 lbs. 2·5 oz., thus proving that no loss of produce resulted from the use of the Centrifuge. The skim milk was tested for butter without a trace being obtained.* Dr. Voelcker examined the

* In confirmation of this experiment, I may here notice a series of experiments carried out at the Agricultural College at Alnorp, and which are guaranteed by the signature of Professor Nathorst, the well-known Principal of the College, and Dr. Nils Engstrom, the Professor of Chemistry. It will be seen that in every test Laval's process gave a superior result to the ice method, which is thus expressed in the Report: "Thus by the ice method there was always used about

two samples of butter, and pronounced that by the new process to be superior as to texture and firmness, whilst that from the Swartz process he thought had a superior flavour, which, however, might be attributed to some difference in the time of making; at least one cannot understand if the texture was good how the flavour could be affected. The time occupied in separating the cream by the Centrifuge was 52 minutes. The agent considered that a machine could be made of double capacity, that is, equal to 60 gallons an hour; but beyond this it would not be desirable to increase the size of the machine.

The question naturally arises as to the practical value of this ingenious discovery. In the first place, whatever advantage follows from having the cream perfectly fresh, is secured. No ice is required; and there is a great saving in both space and apparatus. It will be understood that the Centrifuge requires to be driven by power, either horse or steam, and is therefore more suitable for a factory than for a private dairy. The price of the machine capable of separating 30 gallons an hour is 18*l.*, which, however, does not include the intermediate motion. The machine is carried on a strong T-shaped bracket; it is

1·5 kilo. more milk to 1 kilo. butter, than by De Laval's Separator. The butter obtained from the separated cream has been of the best quality."

New Milk.			Skimmed Milk.	Cream.	Butter.	
Total Kilograms.	Butter Per Cent.	Per Hour Kilograms.	Butter Per Cent.	Per Cent. of New Milk.	Kilograms New Milk to One Kilogram Butter, by De Laval's Separator.	Kilograms New Milk to One Kilogram Butter, by the Ice Method.
360·00	3·52	128·82	..	19·77		
85·00	..	113·22	..	..	25·23	26·88
219·10	3·92	128·01	0·26	18·30		
99·00	..	..	0·19	..		
203·15	3·78	..	0·20	..	25·91	27·01
376·13	3·28	132·06	0·25	20·00		
92·65	..	..	..	13·76		
366·78	..	..	0·29	21·10		
82·88	..	124·31	..	14·09	25·21	26·53
257·55	3·67	166·56	0·27	26·09		
375·28	3·42	132·06	0·23	20·49		The cream churned sweet.
68·00	..	..	..	20·63	26·67	
259·25	3·72	135·15	0·30	22·80		
376·55	..	132·86	..	20·32	27·31	
320·00	..	..	..	19·69		
379·10	..	130·05	..	19·62	26·31	27·87
303·00	..	..	..	15·78		
379·10	..	..	..	19·82	26·20	28·08
299·63	..	..	..	10·72		

easily fixed, and is so simple in construction that it can be readily cleaned. The novelty and ingenuity of the apparatus, considered in connection with the successful results of the trial, fully justified the award of a Silver Medal.

Foreign Implements.

The Stewards of Implements, desirous of marking their appreciation of the enterprise of those foreign exhibitors who at much trouble and expense visited our country, and being precluded from more substantial awards by the fact that the Miscellaneous Judges had not recommended any foreign machinery for Silver Medals, selected the principal collections of implements for Honourable Mention, and in this sense I may be allowed to very briefly allude to those exhibits which are not otherwise mentioned.

Honourable Mention for Foreign Collections of Implements.

Messrs. H. F. Eckert and Co. (Limited), Berlin, Germany.
Le Comte de Beaurepaire, Grivesnes (Somme), France.
M. Alfred Clert, Niort (Deux-Sèvres), France.
Mr. Eduard Ahlborn, Hildesheim, Germany.
M. Odile Martin, Jardin d'Acclimatation, Paris.
MM. Rouillier and Arnoult, of Gambais, Versailles (Seine-et-Oise), France.
M. Voitellier, Mantes (Seine-et-Oise), France.
The Marquis of Riscal, Estremadura, Spain.
M. Simond Legrand, of Bersée, par Pont à Marcq, Nord, France.
M. A. Engström, 13, Faubourg Poissonnière, Paris.

The post of honour in this classification has properly been awarded to *Messrs. H. F. Eckert and Co.* (Limited), of Berlin, for their admirable collection of general agricultural machinery, including a novel threshing machine for horse-power, with a 5-foot drum. The special features are the way in which the concave is adjusted by a central lever, acting on both the hind and fore portion at once, saving time and insuring accurate adjustment, and the arrangement for driving the drum by a double cross belt, which insures equal pressure on the pulley and tends to equalise the wear on the brasses. The straps are kept tight by the use of a regulating tension to which they can be adjusted with the greatest ease. This is a great advance over the ordinary spur-wheel pinion by which horse-power machines are so frequently driven. A large collection of well-made and reasonably priced single- and double-furrow ploughs, and seed and paring ploughs, three and four furrows, well braced and light, drills, broadcast machines, grinding mill, &c., completed the entry.

The *Comte de Beaurepaire*, of Grivesnes (Somme) France, contributed a very useful machine for washing roots, easy to

work, filled and emptied with facility, efficient in action, and reasonable as to price, viz., 8*l.* on rails, at Ailly-sur-Noye.

Mons. Alfred Clert, of Niort (Deux-Sèvres), France, showed a revolving cylindrical seed-separator, which is a modification of the machine introduced by Pernollet. The peculiarity is that the machine is in two distinct parts, which can be worked together or separately. The cylinders are made of sheet iron stamped with a number of indentations. The first portion has an arrangement for separating long seeds, such as oats, &c., which will not rest in the perforations, which are of large size so as to hold the wheat and round seeds, whereas in the second screen the perforations are much smaller, and therefore separate the round seeds, hareweed, &c., from the wheat. The corn is supplied from a hopper over a shaking screen into a tube. The shaking is produced by a steel spring acted upon by a small ratchet wheel on the driving spindle. The screens are driven from pulleys by 1-inch leather belting; the grain not separated by the first screen is carried by a screw worm to the end of the machine, falls into the cups of an elevator, and is so raised for delivery into the second separator. The Judges carried out an experiment, taking a mixed sample of wheat, oats, vetches of different sizes, representing cockle seed, dust, &c., in all 1 bushel 1 peck; it took fifteen minutes for this quantity to pass through the machine, which equals about 5 bushels per hour. The work was excellent; a perfect separation of dust and dirt (removed by a parallel screw about 9 inches long), oats, weed-seeds, and wheat having been effected. The latter on reaching the end of the second screen passes by a number of holes into an outer screen, sloping in the opposite direction, and is thus brought down to a box underneath. The separation was admirable, but the results as to quantity were not sufficient to justify a Medal. The price in the Catalogue is 10*l.* 16*s.* on rails, at Niort; packing extra. The frame appeared rather light.

The dairy exhibits of *Mr. Ahlborn* have already been noticed, and the poultry rearing and feeding appliances of *M. Odile Martin*, *MM. Rouillier and Arnoult*, and *M. Voitellier*, will be treated later on.

The *Marquis of Riscal*, Estremadura, Spain, exhibited a collection of extracts of green oak in a dry condition, as made by A. Pouriau, engineer, Paris, from raw materials obtained from the exhibitor's estate. Price 5*l.* to 5*l.* 18*s.* 6*d.* per cwt. It would be interesting to know how far these articles are available for general consumption. A collection of leathers and skins tanned with the extract appeared to prove its utility.

Monsieur Simon Legrand, of Bersée, par Pont à Marcq, Nord, France, who is a seed grower of repute, exhibited samples of

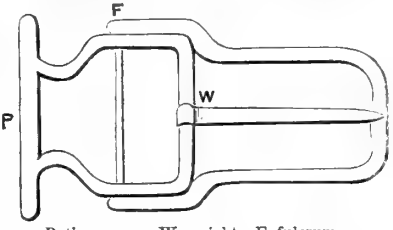
wheat and oats, both in sheaves and in grain; beetroot on the stalk and in seed, also the seed-bearing beetroot. I learnt from a note attached to this latter entry, that "a laboratory is established in connexion with this property for the analysis of the beet adapted for reproduction; also for the analysis of feeding stuffs consumed on the property, for manures, and for analysing the soil before and after each crop."

Lastly, there was *Mons. A. Engström*, 13, Faubourg Poissonnière, Paris, with three exhibits which may safely be characterised as both novel and highly ingenious, if not altogether suitable for English requirements. No. 1 is an electrical apparatus comprising a small battery, which is placed under the seat or within convenient reach of the driver, and communicating wires to the horse's bit, which has in the centre a pad, insuring contact with the surface of the horse's tongue. In case the animal proves restive, attempts to bolt, or tries to get the bit in his teeth, the battery is put to work, and the horse has a very smart shock, which would effectually check his impulses. A similar apparatus is used in breaking, shoeing, or dressing vicious horses. Article No. 2 is still more ingenious; here electrical agency is made use of to prevent crib-biting. A battery charged for six months' use is so connected with the metal crib, that whenever the horse's teeth come in contact with the surface, he gets a sharp shock which would very soon effect a cure. Article No. 3 is a safety buckle for a harness horse, so that in the event of the animal falling down, he can be liberated from the shafts without cutting the traces. This is effected by a simple leverage, the tongue of the buckle being attached to a frame which swings upon a central axis. When the buckle has to be detached, all that is required is to press upon the end of the frame, when the tongue is drawn back and liberated from the strap.

Some further details as to the electrical appliances may be interesting. The apparatus consists of a single bit, of a bridle enclosing two conductors, of a noseband, a curb, and an electromagnetic machine, acting always with regularity and without expense. The apparatus may be used on foot, for vicious horses difficult to groom, to dress, to clip, or to shoe. It is equally applicable to saddling or harnessing horses, whatever vice they may possess. The advantages claimed are that the horse is not struck or hurt. The correction, which is rather a surprise than a chastisement, is instantaneous, it occurs during the act of disobedience; more than all, the correction is uniform, it is independent of the character, cool or violent, of the person who inflicts it. Carriage accidents are avoided. The most vicious horses under this treatment become gentle. Trials

have been made with such, and without exception they have submitted on the first application. At the request of M. Moreau Chaslon and M. Bella, officials of the Paris Omnibus Company, trials were made at the dépôt, Malesherbes, where the most vicious horses are collected. Six animals were presented; until then they had been treated on Rarey's system, which is a veritable torture.

Fig. 8.—*Mons. Engström's Electric Apparatus for Taming Horses.*



P, the power; W, weight; F, fulcrum.

These six horses were conquered in an hour's time, with the application of the apparatus. The same horses were tried twice afterwards, at intervals of eight days, and were found to be thoroughly tamed, without further use of the apparatus. Similar experiments were made on the tramways before the Head Manager, the Veterinary Surgeon, and the Council. Identical results were obtained. Other experiences coincide. The price of the apparatus for taming and for preventing crib-biting is 6*l.* each.

Poultry Production.

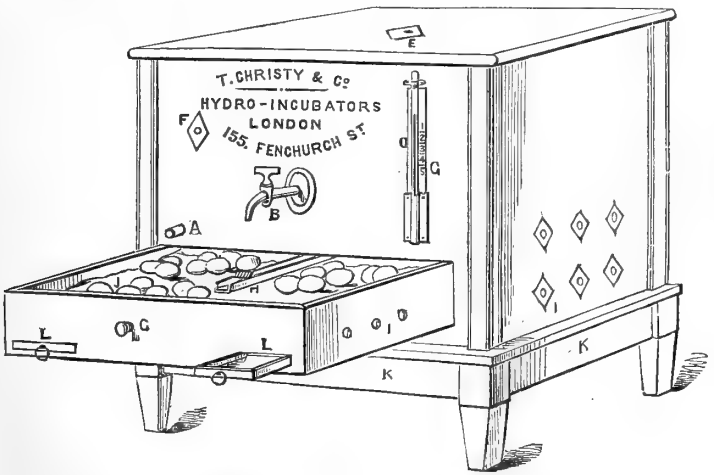
English farmers must no longer neglect the smaller economies, by attention to which foreigners add so largely to their income. It is a disgrace to this country that whilst the imports of eggs and poultry into the United Kingdom has reached the enormous sum of 8,000,000*l.* in one year, we have not even a quotation of English eggs in the London market, which are supplied principally from France, but also from Canada and the States. Poultry can be made a material source of income. There is nothing in our climate prejudicial to the growth of fowls, on the contrary, the abundance of insect life due to our humidity is highly favourable to their early development. It was only last summer that spring ducks were making from 15*s.* to 17*s.* a couple in the London market. To *Messrs. E. Rouillier-Arnoult* and *E. Arnoult*, of Gambais-les-Houdan (Seine-et-Oise), we are indebted for having first made hydro-incubation a practical success. *Mr. Thomas Christy*, of the firm of Christy and Co., of 155, Fenchurch Street, London, has made several improvements in detail which render his apparatus more suitable for our requirements. According to the report of M. Geoffroy Saint-Hilaire, addressed to the President of the Société d'Acclimatation, under date December 1st, 1875, the

discovery was the result of an accident. Messrs. Rouillier and Arnoult being compelled to leave Paris and reside in the country, on account of the health of one of the party, chance led them to Gambais, near Houdan, where poultry rearing is a speciality, in which they engaged, using turkeys to sit upon hens' eggs. One day, 40 out of 60 turkeys that were sitting, for some reason died. This was a most serious loss, especially as the chicken had been sold in advance. They were compelled to fulfil the contract at any cost. Under these circumstances the old adage of "necessity being the mother of invention," came into play; they bethought them to take those eggs which were most advanced, and place them between two eider-down quilts, surrounded by bottles full of hot water. It was a great and continual trouble to keep up the heat, but the success was complete, and the contract kept. Whilst this was going on, 13 partridge eggs, which had been sat upon for 15 days, were brought to the operators and placed with the hens' eggs, and 12 partridges were hatched out. Attention being thus directed to artificial hatching, experiments were made with the incubators of Carbonnin and Robert. The first depended for its heat upon a petroleum lamp, difficult to regulate; and in the second, in which apparently water was the heating medium, the temperature could not be maintained. Thus were these experimenters led to the construction of their hydro-incubator, which has achieved in France a well-deserved success, and is now, with certain improvements in detail, made in this country by T. Christy and Co. The machine exhibited by Rouillier and Arnoult, at Kilburn, which was for 50 eggs, comprised a nearly square box 20 inches in length and width by 22 inches deep; the eggs were contained in a drawer at the bottom; at the top is a compartment termed the drier, in which the chicken are placed on hatching, and kept for 24 hours, without food. The water space contains 6 gallons. It is lined with zinc, and the space between it and the outer walls of the box is filled with felt. The depth of the egg drawer is $2\frac{1}{2}$ inches. About 2 gallons of boiling water are added morning and evening, after a similar quantity has been withdrawn; the eggs are turned at the same time; a water-gauge at the side measures the water drawn off; a second tube from the water chamber allows of the escape of air. A certain amount of moisture is required in the egg drawer; this is said to be provided for by a current of cold air from the outside entering the drawer by a small opening at the side, and condensing the moisture contained in the hot air. In the morning only, the eggs should be exposed for about 20 minutes. The artificial mother comprises a square box with legs projecting $4\frac{1}{2}$ inches, this allows the chicken ingress and egress; inside is

a zinc box-like urn protected from the air by felt stuffing, a soft baggy material hangs down from the bottom of the box; at night, screens shut in the chicken. Surrounding the mother is a small yard covered with glass, which affords shelter from rain, &c.; and this, again, can be enclosed by wire netting in a grass field or other suitable locale. The water in the artificial mother only requires to be renewed once in 24 hours. The receptacle holds 5 gallons of water, and 2 gallons added are sufficient. The price of the mother alone, without the external shelter, is 2*l.* Of course the apparatus is made in different sizes, capable of dealing with from 50 to 450 eggs.

Mr. Christy's experience has led him to the conclusion that the water space must be of a certain size, sufficient to hold 15 gallons, in order that a tolerably uniform temperature may be maintained, hence his smallest machine is for 90 eggs. I reproduce a drawing and description from his pamphlet on "Hydro-Incubation," and those who are interested in the subject will do well to spend one shilling in the purchase of this book.

Fig. 9.—*View of Messrs. Christy and Co.'s Hydro-incubator.*



Hydro-incubator for 90 *Eggs.*

A is the pipe only used for completely emptying the cistern; B, the brass tap for drawing off the water prior to replenishing the cistern with boiling water; C, the glass gauge, with a marked scale, D, at the side, to register the height of the water in the cistern; E, the pipe for filling the cistern; F, the tube for the escape of air when the water is put into the cistern; G, the drawer, into the front of which the new earth-trays slide; H, the thermometer in the drawer; I, I, the air-holes in the sides of the incubator and drawer; J, the flannel; K, the stand or box used to keep the incubator off the ground; L, the earth-trays.

The following are the improvements claimed by Mr. Christy:

1. The packing consists of a non-conducting material composed of desiccated cork-dust and sawdust surrounding *iron* tanks, in place of oat-chaff or felt round zinc tanks.

2. The eggs are supported on perforated plates of metal, under which are trays of damp earth, experience having shown that more moisture is necessary. The closer the artificial process imitates nature the more complete will be the success. All poultry keepers know that a stolen clutch is more numerous as a rule, than box-hatched eggs, and one principal reason is the beneficial influence of the damp soil. I believe that Mr. Christy has recently extended the earth trays, so that the whole of the eggs are influenced by the soil.

3. There is a free current of air passing over the earth trays, and under and over the eggs.

4. The trays for the eggs can be adjusted for large eggs, such as turkeys, or placed nearer the cistern when hatching fowls' eggs.

In order to ensure an adequate amount of moisture, small tin troughs are placed in the drawer, and kept filled with water and soil.

At the trial at Hemel Hempstead last autumn, Christy's Incubator won the prize of 25*l.* in competition with three other inventions. The Report of the Judges, and the register of the temperature will be found duly recorded in Mr. Christy's pamphlet.

The price of No. 3 set, consisting of a 90-egg incubator and stand, with an open-air rearer, and 24 yards of wire fencing, an egg-tester, pedestal, zinc troughs, and 2 thermometers, is 11*l.* 15*s.*

The remaining Incubator shown at Kilburn was that of *M. Voitellier*, of Mantes (Seine-et-Oise), which appeared more primitive and less complete than the others. It is reasonable as to price, and according to the cards exhibited, a large trade had been done. It comprises an annular water-tank of zinc enclosing a cylindrical space 20 inches in diameter by 15 inches deep. The bottom of the space is made of wood, on which is placed a layer of sand and a thin coating of straw. As working at Kilburn, the space contained, besides the eggs, a glass of water, which is requisite in order to give the necessary moisture, otherwise the eggs must be occasionally wetted with a brush. The box enclosing the cistern is square, and the interstices between the outside frame and the water-tank are filled with some non-conducting material, generally felt. The tank holds 65 quarts, and the heat is maintained by adding a certain quantity night and morning. The eggs are not, as far as we could see, ever

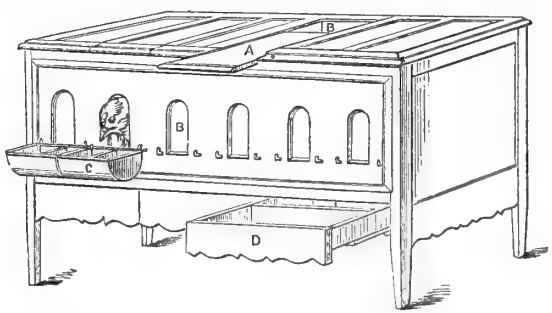
taken out, all that is done is to turn them night and morning. At the Hemel Hempstead trials, a machine of this make, which was sent by Miss May Arnold, failed utterly, as out of 35 fertile eggs not one was hatched out, and no chicken were found in the eggs. The artificial mother comprises a square box 21 inches by 8 inches deep, into this drops from above an internal box containing the hot water, and lined with tin. Underneath the external box is hung a pad of velvet. The distance of the box from the ground is about $2\frac{1}{2}$ inches.

Probably the greatest novelty in connection with poultry feeding in an English showyard, was the apparatus for fattening poultry, invented and exhibited by *M. Odile Martin*, of the Jardin d'Acclimatation, at Paris. Let the reader imagine a whirly-go-round, with two stories or stages, each containing 30 receptacles. Smaller machines are made ranging down to six spaces. Each receptacle is 18 inches deep radially by 9 inches clear in front and 5 inches behind. The divisions are separated by boarding, save in the centre, where there is an upright wire, or rather two wires, one for each pen; on the wires are rings about 1 inch in diameter, a light chain 4 inches long is attached to the rings, and terminates in a leather strap and buckle, which encircles the leg of the fowl. The floor is close boarded in front and open behind, with two wires placed radially, so that the manure can drop into a tray underneath, which is readily removed. The food, in the form of gruel, and comprising a mixture of Indian corn and buckwheat meal and milk, is placed in a machine fixed at a convenient point. Attached to this is a flexible tube terminating in a spring metal mouthpiece; a dial marked in centilitres, with an indicator arm, shows when the required quantity of food has been administered. The process of feeding is very simple; the operator seizes the fowl by the neck, opens the beak, and inserts the tube down the throat, opens the valve, and delivers into the stomach a certain quantity of food, as shown by the indicator. The process is very rapid, and in a very short time a large number are fed. The fowls are kept in this apparatus and thus treated for a period varying from 15 to 20 days, when they are fit for the table. At first sight, this confinement and process of feeding appears cruel as well as unnatural, but the appearance of the birds and their anxiety to be fed somewhat dispels this idea; and the Society for the Protection of Animals, in Paris, has pronounced in its favour as more humane than the old-fashioned plan of cramming in ordinary use by the peasants. The invention is new only as regards this country, it dates back to 1867. In 1867, M. de la Fosse, Engineer-in-chief for Roads and Bridges, thus reports to the Agricultural Society of the Department de l'Allier:—

"In summing up, gentlemen, your Commission wish to state that the method of fattening, invented by M. Odile Martin, ought to spread rapidly in France. It is convinced that it will be very useful in the interests of agricultural production that this invention should be known and appreciated at its just value, and thinks that the creation of a model establishment at the Jardin d'Acclimatation, in Paris, will be the surest means of making it known." Within a year of the issuing of the above report, M. Odile Martin obtained a concession from the Jardin d'Acclimatation and from the City of Paris, for setting up this business. Not only have fowls of M. Odile Martin's own feeding obtained premiums, but many others testify to most satisfactory results. Thus, M. Paillard, writing to the inventor, states that having shown each year at Paris, a lot of ducks fed by his mechanical apparatus, he had obtained a prize at each meeting. Again, M. Jules Reiset wrote to the Director of the Jardin d'Acclimatation on the 12th May, 1878: "With M. Odile Martin's mechanical feeder, we obtain excellent poultry. As regards the rapid production of flesh, I have obtained remarkable results, representing a gain of 50 per cent. for each fowl." Many other testimonials might be inserted. The apparatus was exhibited in different forms. The revolving frame, with receptacles for 60 fowls, and the feeding apparatus costs 32*l.* in Paris.

Messrs. Christy and Co. exhibited The Engraisseuse or poultry-fattening pen, manufactured by Madame Aillerat, of La Flèche, France, who was present at Kilburn to explain her invention, and to exhibit extraordinary specimens of La Flèche poultry fed by this process. I am enabled, through the courtesy of Mr. Christy, to reproduce the illustrations from his pamphlet.

Fig. 10.—*Front view of the Engraisseuse for six Fowls.*



Ingress to each compartment is obtained by slides, one of which is shown open at A. The feeding trough is seen at C, and one of the drawers, D, which receives the droppings, is shown open.

Fig. 11.—*Interior of a pen of Madame Aillerat's Engraisseuse.*

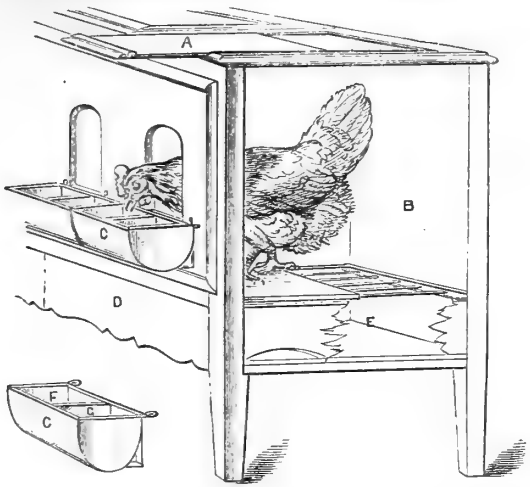


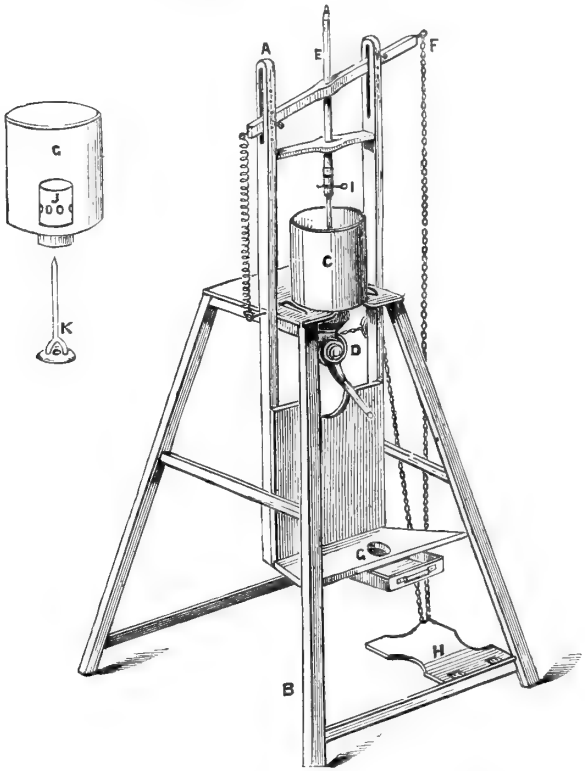
Fig. 11 shows the interior of the pen with a fowl as it stands when feeding. The floor is partly close-boarded and partly open-grilled to allow of the passage of the manure into the drawer. The metal trough is also shown in detail, F being the compartment for grain or prepared food, G that for milk and water. The fowls are not compelled to eat, and consequently, though they progress well, the process is not so rapid as when crammed. Great care has been bestowed upon the construction of the Engraisseuse. There is a drawer to catch the manure, which falls through a grating. The food is placed in the metal trough, as described above. The dough usually consists of flour mixed with milk and water; or barley, buckwheat, or rye-flour may be used as a change. Experience shows that poultry must be kept very clean, and the food-pans are washed out once a day. Specimens of La Flèche poultry fed by Madame Aillerat, weighing 7½ lbs. each, were shown. The price of this apparatus is 3*l.* 18*s.*

For cramming purposes *Messrs. Christy and Co.* exhibited the Patent "Compression," manufactured by MM. Rouillier and Arnoult, the working of which is illustrated in Fig. 12 (p. 718).

The objection to this machine as compared with that of Odile Martin, is that the fowl has to be taken out of its box by the wings, placed on the platform G; the head is held in the right hand; the forefinger and thumb pressing at the side of the mouth opens it; then the head of the bird is raised, and the tube, as far as the brass junction of the pipes, slips down

the throat; the pedal is then pressed by the foot, and the charge enters the crop of the bird. The plunger then returns to its position, and another supply of food enters the tube. The quantity discharged is regulated by the position of the lever in the standard A, which can be fixed by a bolt.

Fig. 12.—*Diagram illustrating Messrs. Rouillier and Arnoult's Patent "Compression" for Fowl-feeding.*



A, is the left-hand support, through which passes the lever F; it is pierced with holes at the top for regulating the charge; B, the framework; C, the receiver for the food; D, wheel and valve for freeing the charge; E, the piston; F, the lever, with spring, and attached by a chain to the pedal H; G, the platform, with small hole for the waste to drip through into a pan underneath; H, the pedal; I, a key, fixing the plunger on to the piston; J, inside view of the reservoir; K, the plunger, working inside J.

Miscellaneous Novelties.

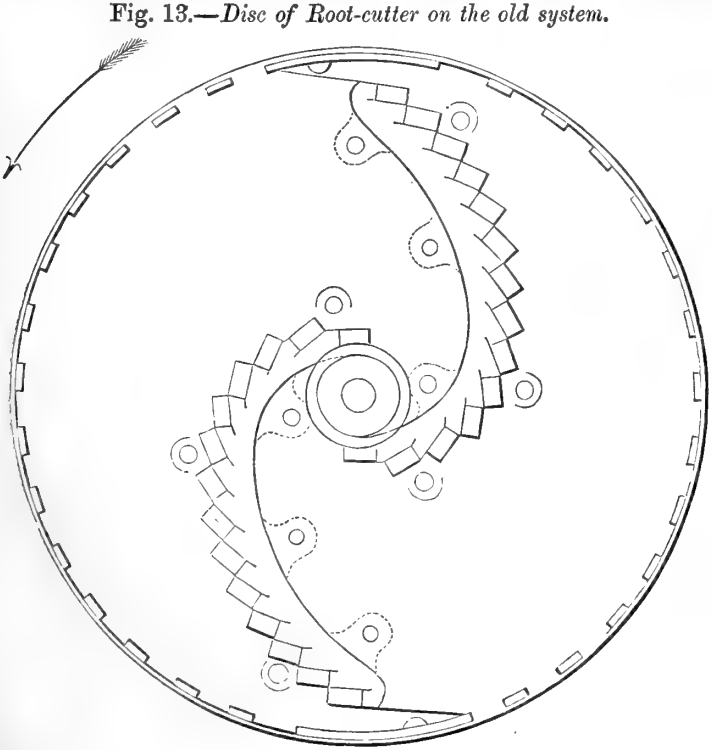
No. in Catalogue.

1. *First-Class Mention.*

92 Messrs. R. Hornsby and Sons, for an improved disc in their Patent Turnip Cutter.
243 Mr. William Brenton, for samples of Patent Door and Gate Fastenings.
4432 Kirkstall Forge Company, for Patent Rolled Shafting.
5314 Mr. Henry Brinsmead, for Patent Double-action Straw-shaker.
8579 Mr. George H. Innes, for Drum Guard attached to a Threshing Machine.
9701 Mr. Francis Ley, for Ewart's Patent Detachable Malleable-Iron Drive-Chain.
10073 Messrs. Polyblank and Co., for Knowling's Patent Band-sawing Machine.
10661 Messrs. Nalder and Nalder, for Straw Elevator attached to a Threshing Machine.
10694 Messrs. P. and H. P. Gibbons, for Drum Guard attached to a Threshing Machine.
11423 Messrs. Thomas Christy and Co., for Hydro-Incubator.

Messrs. R. Hornsby and Sons **have introduced a new patent combined root-pulper, turnip-cutter, and slicer, which can readily**

Fig. 13.—*Disc of Root-cutter on the old system.*



be adjusted to fulfil either of its threefold functions. The disc is skeleton in form—a ring with centre-bar and axle, and plates to fill it in. There are two pairs of plates—one with knives for cutting finger-pieces, replaceable in a few seconds by slicing-knives, and the other fitted with pulping-knives. The arrangement of the knives in the finger-piece cutting-disc is entirely novel, and is applied to a new single-action machine as well as in the combination I am describing, and which will be readily understood by the illustrations (Figs. 13 and 14).

Fig. 13 (p. 719) shows the disc of the root-cutter on the old system, in which the cutting was commenced on the outside and finished at the centre of the disc. The knives thus placed had a tendency to drive the roots to the outside of the hopper.

Fig. 14 shows the disc on the new system. Here the cutting commences on the outside and at the centre about the same time, and finishes about midway between the axis and the periphery of the disc. It will be seen that the clear spaces between the finishing of the cut and the commencement of the next cut is greater, giving the root more time to fall close to the disc, so that a full cut is made every time, instead of in some cases only a thin slice.

Fig. 14.—*Disc on the new system.*

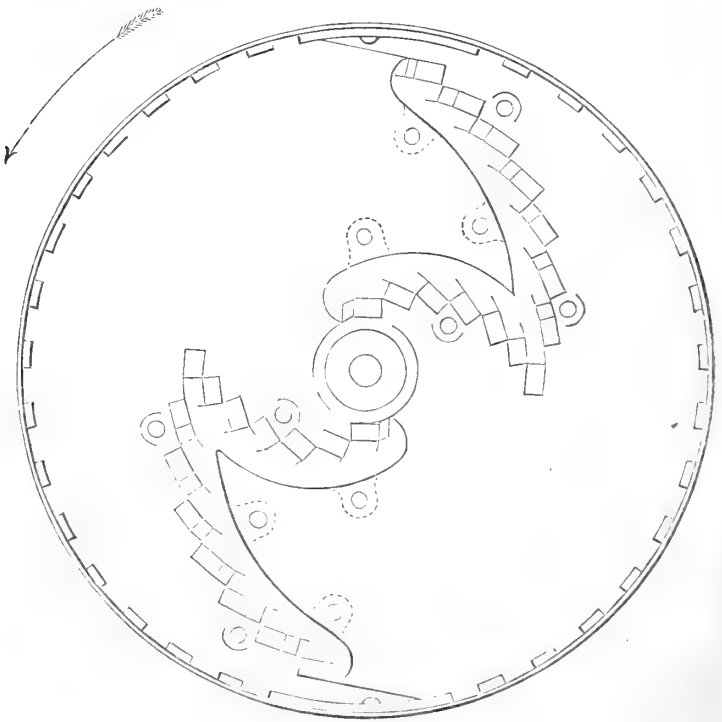
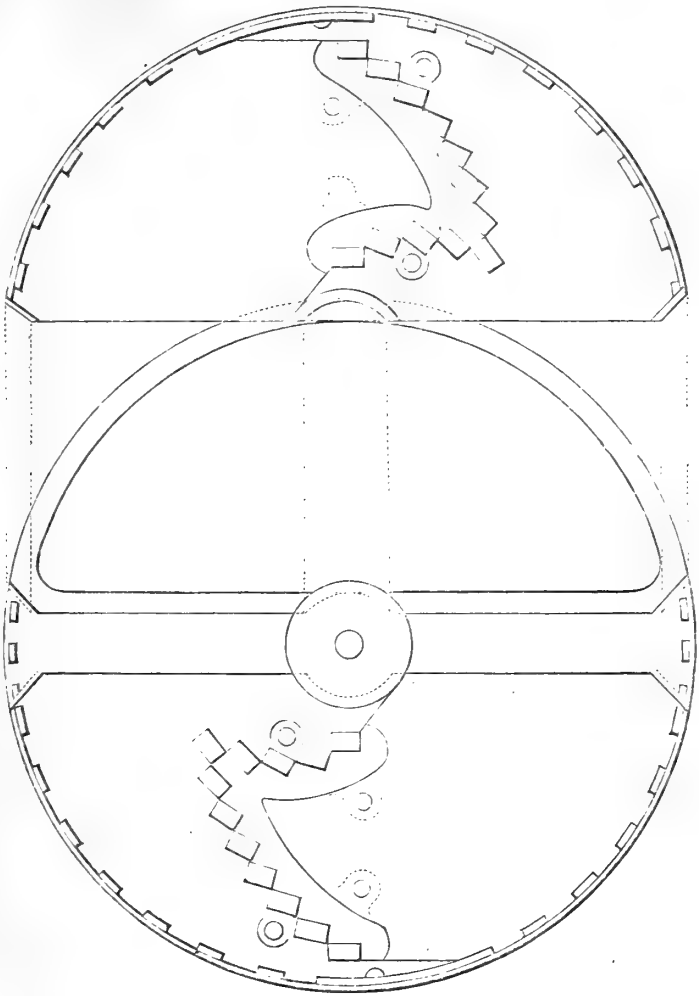


Fig. 16.—*Disc of the Convertible Machine.*



Another important point is, that the roots are held much steadier during the operation, because the cut is commenced on both sides at once, the roots being clutched on opposite sides at the first contact, and firmly held until the whole cut is taken.

Fig. 15 (p. 722) shows a bar of knives detached. This can be readily done by an unskilled labourer in a few minutes.

Fig. 16 shows the disc of the convertible machine. It also shows the method of removing the half-discs and replacing them by pulping discs when required. To attach the slicer knives the cutting discs remain, but the bars of knives are removed, the slicer knives taking their places. The half-discs are secured

in position by a ½-in. T-ended stay, which is shown detached at Fig. 17, and in position at Fig. 18, which gives a sectional elevation of the discs. When the half-discs require changing, the nut nearest the spindle is screwed back, and the T-end of the stay detached from a pair of lugs cast on the disc and shown in Fig. 18. The disc is then lifted out of position by hand, and replaced by a disc with the kind of cutters required, which is secured in position by again screwing up the nut on the stays.

Fig. 15.—*Bar of Knives detached.*

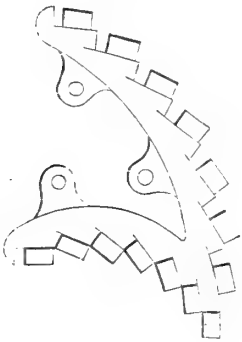
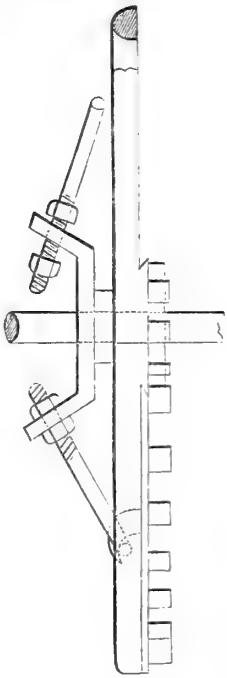


Fig. 17.—*T-ended stay, detached.*

Fig. 18.—*Sectional Elevation of the Disc.*



The Judges tested the machine as a turnip-cutter, and found the action very satisfactory, the finger-like pieces being uniform in size. No part of the root can escape from the machine without being cut, and the arrangement of the knives appears to lessen the draught. The machine has a new hopper of large capacity, composed in the top part of angle-iron, and in the bottom of round wrought-iron bars, through which dirt, &c., can escape. The combined machine, C C A, fitted for the three operations, costs 8*l.* 5*s.* If as a pulper and slicer only, 7*l.* If as a pulper and cutter for sheep only, 7*l.* The simple turnip-cutter, C A, costs 4*l.* 15*s.*

Mr. William Brenton, of Polbathic, St. Germans, whose name

has hitherto been known chiefly in connection with mowing and reaping machines which have a good local repute, now receives first-class mention for patent door and gate fastenings, which are ingenious and efficient.

The present exhibits are an improvement on a former design, because in that two movements were involved—the handle of the bolt, which was crooked, had to be raised above the stop which held it fast when locked, and then drawn back. Now, by having the stop placed at an angle when the handle is raised, the bolt is withdrawn, because the plane on which it travels is inclined.

Fig. 19.—*Mr. William Brenton's Door and Gate Fastenings, showing bolt withdrawn.*

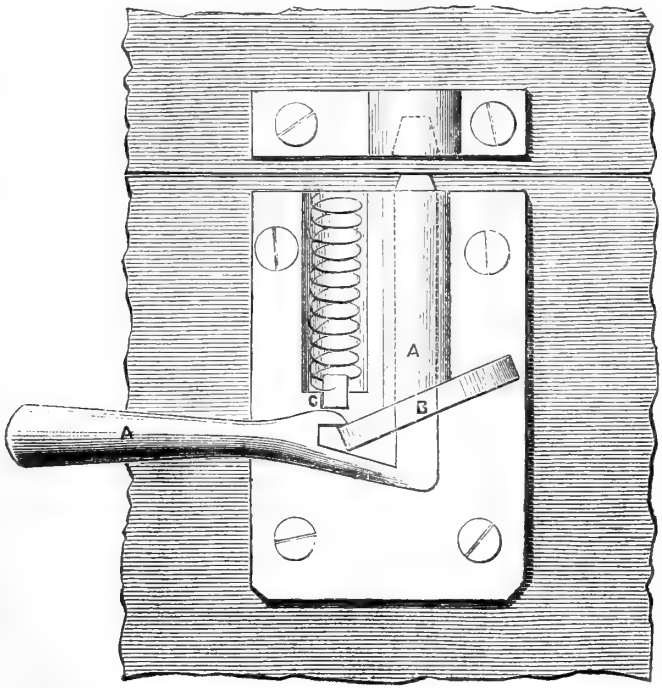
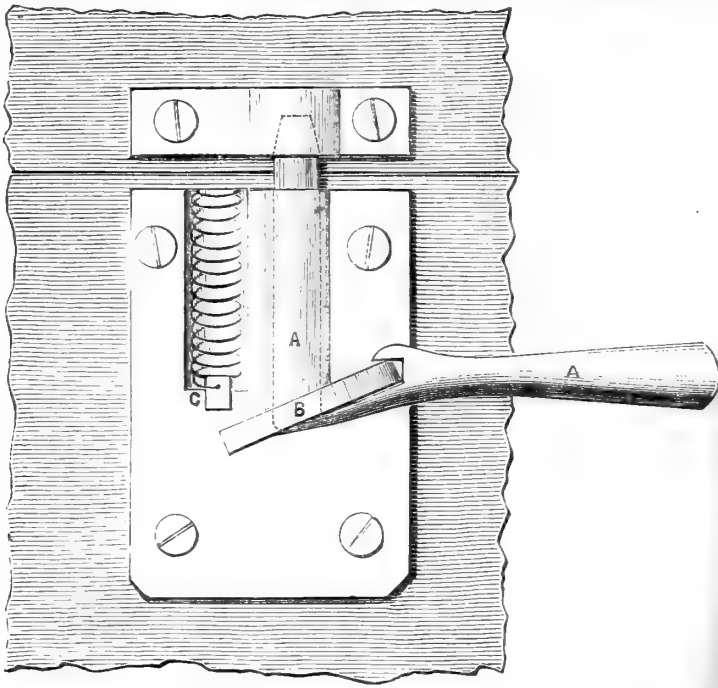


Fig. 19 shows the position of the handle when the bolt is withdrawn. It will be seen that a spring shown at c holds the handle when unlocked. By reversing the handle and placing it in the position shown at Fig. 20 (p. 724), the end of the bolt, which is tapered, is pushed into its socket.

It is quite impossible that a gate or door so fastened could be accidentally opened; and for horse-boxes and all farm-building purposes, such a fastening is most valuable. The jack-fastening for windows is much on the same principle; but in this case the handle is drawn out in the act of turning it round, and the end of the bolt, which is rounded and projects on one side, keeps the handle extended until, when turned again, it can enter the socket.

Fig. 20.—*Door and Gate Fastenings, showing bolt in its socket.*



The Kirkstall Forge Company received first-class mention for patent-roller shaftings, not only on account of the considerable economy in their production, over that of the ordinary turned shaftings, but because of their additional strength, in consequence of the skin not being in any way removed or interfered with. I am indebted to the 'Textile Manufacturer,' of Dec. 15, 1878, for the following description of the process by which the result is obtained :—

"The first operations of piling and rolling the iron are identically the same as when ordinary round bars are being produced. When the bar leaves the rolls, however, it is a trifle larger in diameter than in the shaft intended to be made from it. The bar, after being rolled, is at a good red heat ; it is therefore allowed to cool to a low red heat in daylight, at which temperature it is in the best condition for 'planishing,' as the operation which makes it true and straight is called. The planishing machine is very strongly constructed, and stands well down on the floor to avoid lifting the bars to be operated upon. The machine consists of a pair of vertical discs, which rapidly revolve on horizontal shafts. They are nearly equal in diameter, and are placed face to face, but not with their centres opposite, there being a horizontal distance of about 9 inches between the centre lines of the discs. Supposing the faces to

be 3 inches apart, and the discs to be revolving *in the same direction*, then if a bar slightly larger than 3 inches is placed between them the bar will revolve on its own axis, and will be reduced in diameter to exactly 3 inches. The bar is horizontal, and when it is at the same level as the centres of the discs, it will simply revolve between them, and will have no other motion; if, however, it be lifted above the centres, say about a quarter of an inch, it will, besides revolving, travel lengthways between the discs; should it be a quarter of an inch or so below the level of the centres, it will also travel lengthways, but in the reverse direction. In this way, then, works the machine at Kirkstall Forge. The bar is brought from the rolls slightly larger than is the intended shaft. After cooling in the right temperature, it is placed on the table of the machine, which is on the floor level, and one end is inserted between the discs. It immediately commences to revolve, and travel longitudinally, so that after a little time the whole length of the bar has been operated upon or planished. When it leaves the discs the bar is a shaft, being now, for all practical purposes, quite round and straight, not of course so true as the highest class of shafting, which has been carefully finished in a lathe, but still entirely up to the average of turned shafting, and much better than many specimens. The surfaces of the discs which perform the planishing are perfectly smooth, and during the operation a copious supply of water falls upon them and upon the shaft; hence the latter leaves the machine perfectly free from scale, and with a smooth skin, having a dark blue polish. The Kirkstall Forge Company at present are prepared to roll their shafts of all sizes, from 7 inches diameter down to $\frac{3}{4}$ inch, but they intend shortly to produce them by their patent process so small as $\frac{1}{4}$ inch in diameter. They prefer in all cases to supply their patent shafting cut by themselves to dead lengths, and with faced ends, in order that they may be erected without further manipulation, their customers being thus saved a considerable amount of trouble and expense. These planished bars are of course applicable for many purposes besides shafting; thus with engineers they are used for every imaginable purpose where a true and round plain bar is suitable. For instance, an agricultural implement maker will order some thousands of planished pins about 8 inches long and $1\frac{1}{4}$ inch diameter, and other machinists are similarly supplied. It remains to be mentioned that, according to tests made by Mr. Kirkaldy with his machine, these shafts (in torsion) are one-fifth stronger than rolled shafts of the same diameter, and consequently show a greater gain even than this over turned shafts of the same diameter. This, however, is what might be expected from the nature of the planishing operation.

"The patentees claim, as the most important effect of their patent machine on the bar, the entire removal of all kinks, doglegs, and bends, and the consequent production of a perfectly straight and true shaft. For all ordinary speeds this shafting can be run safely without the trouble and expense of turning any necks, which, by removing the skin, and reducing the diameter, lessen the strength and wearing power. For ordinary purposes, the American clamp couplings, which are loose collars, answer perfectly, and secure the full strength of the shaftings, the necessity for bosses and key-slots being entirely done away with. The patentees claim that they produce their shafting,

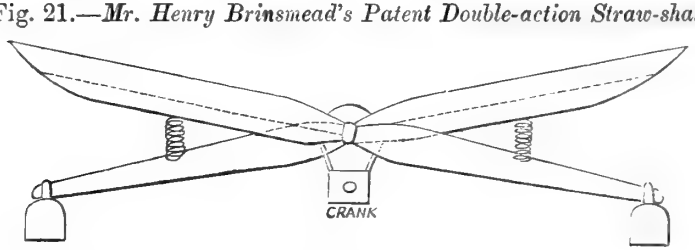
1. Sufficiently uniform in size—
2. Mechanically round.
3. Perfectly straight and true.
4. No turning being required.
5. No waste, no trouble, no labour to user.
6. With 20 per cent. extra tension over ordinary rolled iron in the rough.
7. With increased rapidity.
8. With a smooth skin."

Judging from the specimens exhibited at Kilburn, which ranged from

$\frac{3}{4}$ inch to 7 inches diameter, this is really an important improvement; and the economy of the manufacture enables the article to be sold at a considerable reduction in price. Thus the price per cwt. ranges in iron from 12*s.* 6*d.* to 19*s.*, and in steel from 16*s.* 6*d.* to 17*s.* 6*d.* In the latter material, $4\frac{1}{8}$ diameter is the largest size made. The price of KM Kirkstall bars is 7*l.* 10*s.* a ton, whereas the same quality of iron in patent roller would be 12*l.* 10*s.*

Mr. Henry Brinsmead, of Ipswich, received first-class mention for a novel construction of straw-shakers. The main feature is the use of only one crank, which is placed in the centre under the shakers. Each shaker is in two parts, jointed over the crank. This arrangement produces the same effect as a double lift. The wear and tear on the crank is greatly reduced by springs under the backbone of each shaker, which accumulates the power and gives it out. This plan secures the same effect at both ends that others with a single crank do at one. It is stated by the exhibitor that this shaker has 50 per cent. more *throw* than any other. Price 35*l.* I regret that I am not able to give accurate illustrations, as Mr. Brinsmead's patents were not in a sufficiently secured condition to make full publication desirable.

Fig. 21.—*Mr. Henry Brinsmead's Patent Double-action Straw-shaker.*



Numerous specialities in the way of drum-guards, which are now a necessary adjunct to every threshing-machine,* were shown at Kilburn, and of these the judges selected two for first-class mention. The first of these to be noted is Hunt's patent drum-guard, exhibited by *Geo. H. Innes*, of Royston.

The nature of this invention will be understood by the following drawings, in which Fig. 22 gives a section of the guard, showing the mouth of the drum open for feeding. Fig. 23 shows the drum covered by the slide; and Fig. 24 gives a plan by which it will be seen that the side-boards, &c., are so connected with the feed-board that pressure on any part sets free the slide.

The principle is very similar to that of an ordinary mouse-trap. The slide is connected by means of iron rods on either side with strong springs, contained in two tubes attached to the sides of the feed box, and seen in Fig. 24. The slide is drawn back and retained in its place by a lever, one end of which

* An Act of Parliament, passed April 16th, 1878, and which came into operation on August 1st last, imposes a penalty of 5*l.* on every person using a machine without a proper and sufficient guard.

Fig. 22.—*Mouth of Drum open for feeding.*

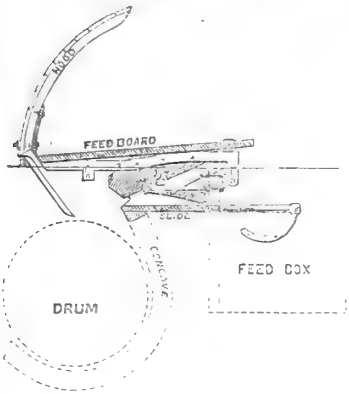


Fig. 23.—*Drum covered by the slide.*

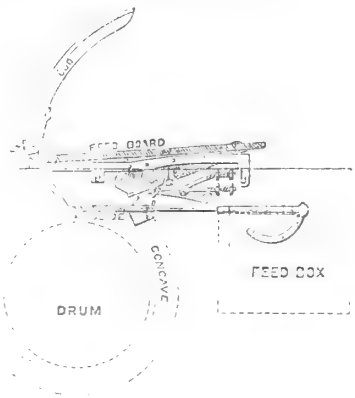
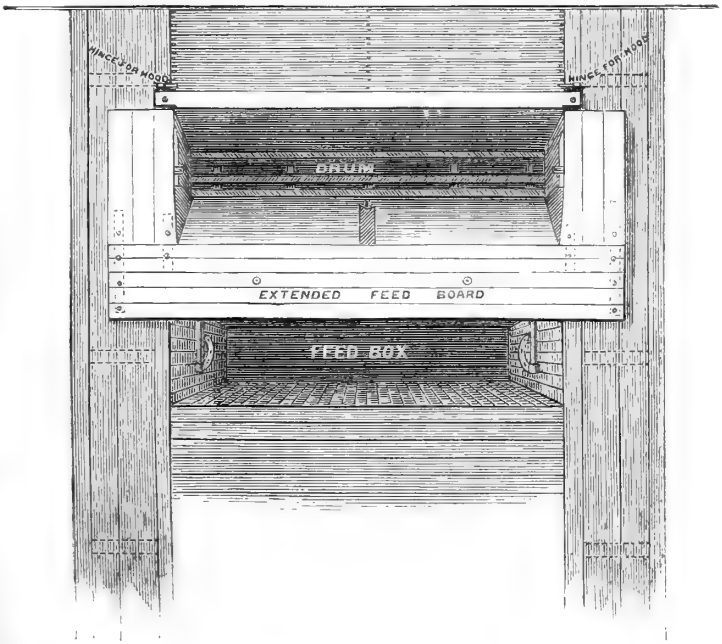


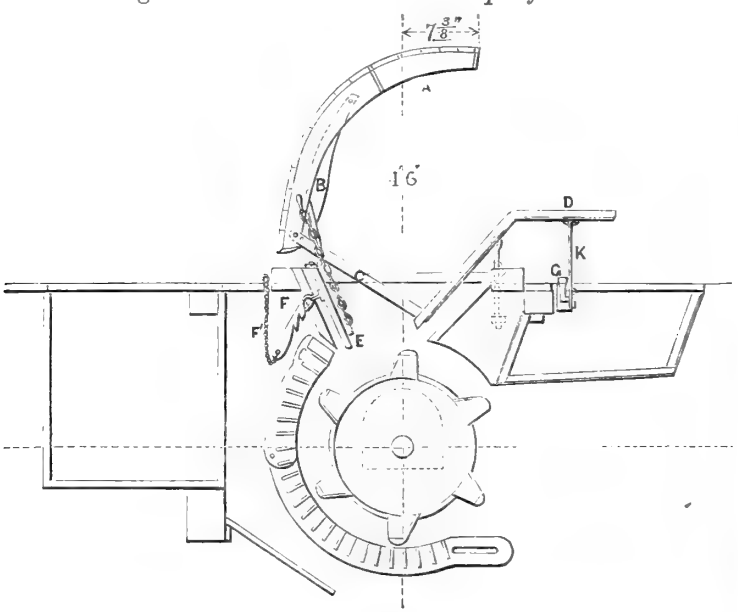
Fig. 24.—*Plan showing the connection of the side-boards with the feed-board.*



catches a notch or lug on the iron rods, whilst the other is balanced by the weight of the feed-board. The setting is so delicate that any considerable pressure on the feed-board, side-boards, or bonnet depresses the end of the lever, thereby raising the opposite end clear of the lug, and thus removing the resistance to the springs which drive out the rods and slide. The action is very rapid, and when the slide has reached the opposite side and come in contact with the woodwork below the bonnet, safety is insured. The only element of risk is the possibility of the hand or foot being caught by the slide, when the consequences would be serious. The price is 3*l.*, exclusive of fixings. It will be understood that the feed-board is so hinged that any pressure on any part of the apparatus, cover, &c., relieves the catch.

The other guard similarly noticed was shown by *P. and H. P. Gibbons*, of Wantage, and is the invention of E. W. Pamplin and Co. It is described as an improved combined hood and platform, and safety-drum shield. The following illustration, which shows the guard open for work, will enable the reader to understand the mechanism :—

Fig. 25.—*Messrs. Gibbons' Guard open for work.*



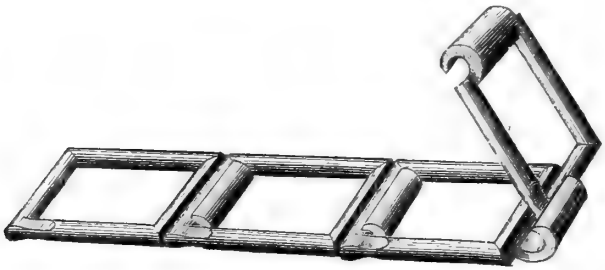
The apparatus comprises an adjustable hood A, which is suspended on pivot pins inserted in the bearing standards B. The lower end of the hood is attached by means of light connecting-rods, C, to hinged pivots on the feed-board, D, and the latter is hung on a tremulus. A self-acting flap-board, E, is also attached by means of an adjusting chain to the hood on the inside, and the "flap-board" is provided with a toothed rack, F, having a small hand chain, F^1, attached as shown. A short connecting link, K, joins the feeding board to a ratchet-wheel, G, into the teeth of which an adjustable spring is

depressed, to any pressure required, by means of a tightening screw, in an angle plate, so that it can be adjusted to the nicest requirement. From the above it will be seen that when undue pressure is applied, either to the feeding-board or the hood, the drum-mouth is at once closed by the meeting of the feed-board and the flap-board, and both are securely locked, and cannot be opened until the locking spring is released by the hand out of the ratchet teeth, when the feed-board by its weight falls open. The flap-board still remains closed until the locking rack is released by the hand chain. The board then falls back, leaving the drum-mouth open for work. It would be very difficult for any one to get into the drum of the machine. The mechanism is simple, efficient, and not liable to get out of order. It will be seen that the hood is made in two parts. The upper portion can be turned back when its position is found to interfere with the feeding of coarse materials into the drum.

Francis Ley, of the Vulcan Malleable Cast-iron Works, Derby, received first-class mention for introducing the manufacture of, and improvements on, Ewart's Patent Detachable Driving-Chain. Hitherto this valuable means of transmitting power has been made only in America. Mr. Ley is able to supply it on the same terms, the purchaser saving expenses of carriage. Nor is this all. Important improvements have been introduced, which render the article much more accurate. First of all, as regards the metal: much attention has been paid to the production of malleable castings that are strong, durable, and homogeneous. The metal has the appearance of a mild steel; it is very ductile, and may be readily stamped, punched, drawn, or twisted, without heating. When turned it takes a high polish, and when burnished is peculiarly rich. It can be readily hardened, not being blistered, scaled, or warped, in the process. It is therefore specially suitable for chain gear, where the friction on the links is so considerable. Mr. Ley has introduced special machinery for the mouldings of the links, in which accuracy of pattern is of the greatest importance, not only as ensuring a secure joint, but also enabling the links to be removed. Instead of moulding from loose patterns, as on the American and English system, he has invented a system of moulding the links from stereotypes, which produce marvellously accurate castings. The stereotypes insure perfect accuracy *in the pitch* of the chain, as no rapping or other carelessness in moulding can render the casting imperfect in dimensions. Thus the chain must always work true on the wheels. The shape of the links has been altered from the American pattern. The latter are straight at the neck, whereas in these they are bulged out slightly, thus preserving the sectional area throughout. This is considered a great improvement. Mr. Ley is prepared to guarantee the metal to stand a tensile breaking strain of 25 to 28 tons per square inch with a fair amount of elongation. The nature of the chain will be readily understood by the subjoined drawing (Fig. 26, p. 730), which represents four links, the upper one partly detached.

The chain in its simplest form consists of a plain hinged link. The hinge has a groove, in width about one-third of the circumference of the opening. The link is flattened out on one side, at the opposite end to the hinge, to the thickness of the groove, and thus enables the links to be joined together by merely passing the plain end of the link into the corresponding hinge in the next link. As the chain can only be threaded together at the angle shown in the illustration, and as it runs, when at

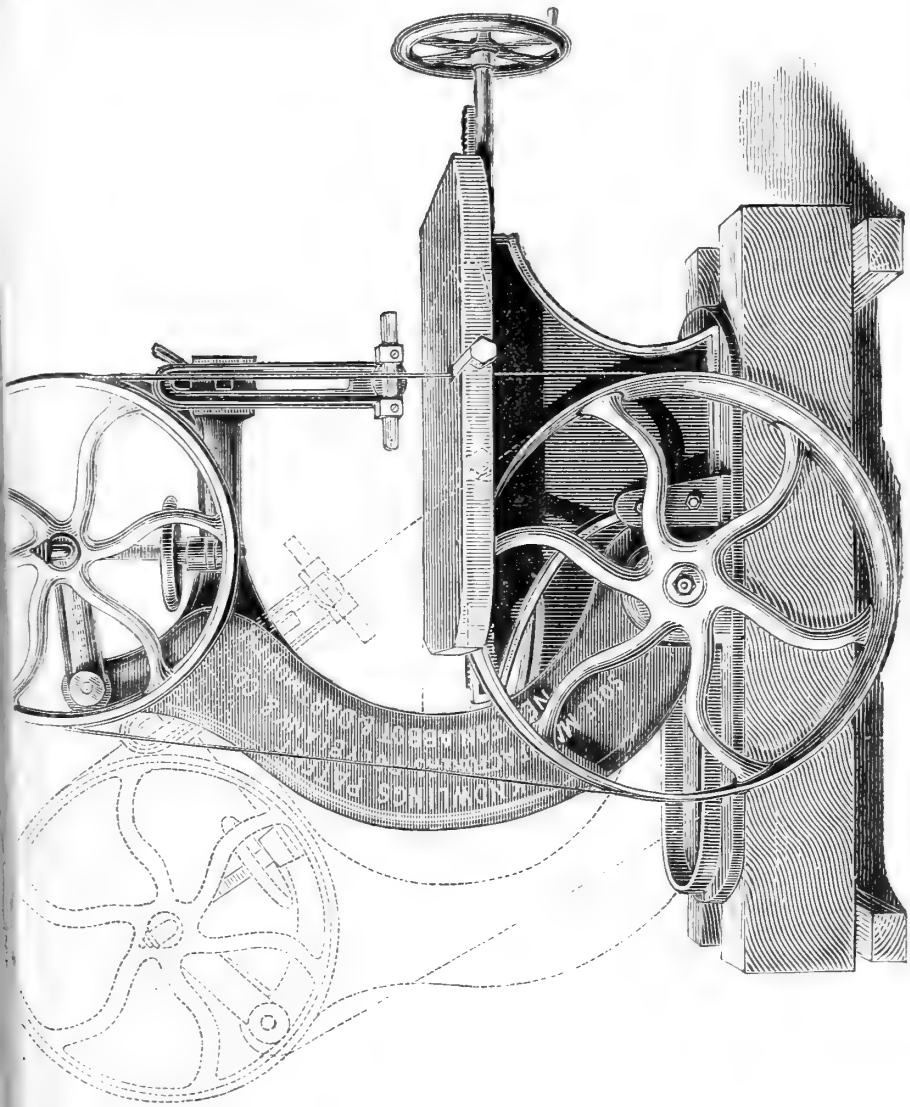
Fig. 26.



work, with the groove outwards, it cannot possibly fall to pieces in work; whilst every link being interchangeable enables it to be lengthened or shortened with the greatest dispatch. These chains are available for many purposes, and are especially valuable for carrying elevator buckets. Mr. Ley has lately executed orders for rice elevators for Rangoon, to raise 100 quarters per hour to a height of 50 feet; for cement-clinker elevators, to raise from 18 to 20 tons per hour; also elevators for brick-machines and linseed-cake mills, for discharging coals out of ships' holds, lifting sewage-water, &c., including a chain-and-bucket pump to lift water out of a mine shaft, the miners putting in more links and buckets as they lower the "shaft." Our readers are probably aware that this form of chain has been adopted in all self-binding reaping-machines in America, and answers admirably. The following are some of the advantages of chain-gearing over leather or india-rubber fittings:—1. Positive transmission of power. 2. Stands exposure to wet or heat. 3. Much less liable to break. 4. No expense in belt-fasteners. 5. No friction. 6. No tension. 7. No stretching. 8. No loss of time, as, if the chain breaks, any one can put in a new link. 9. Less costly, being only about half the price of ordinary belting of corresponding strength. The sprocket-wheels are also much cheaper than turned pulleys. They should be accurately made. The pitch of the teeth should very slightly exceed that of the chain, so as to enable the teeth to gain on the chain.

Messrs. Polyblank and Co., of Newton Abbot, Devon, were

Fig. 27.—*View of Messrs. Polyblank and Co.'s Band-saw Machine.*



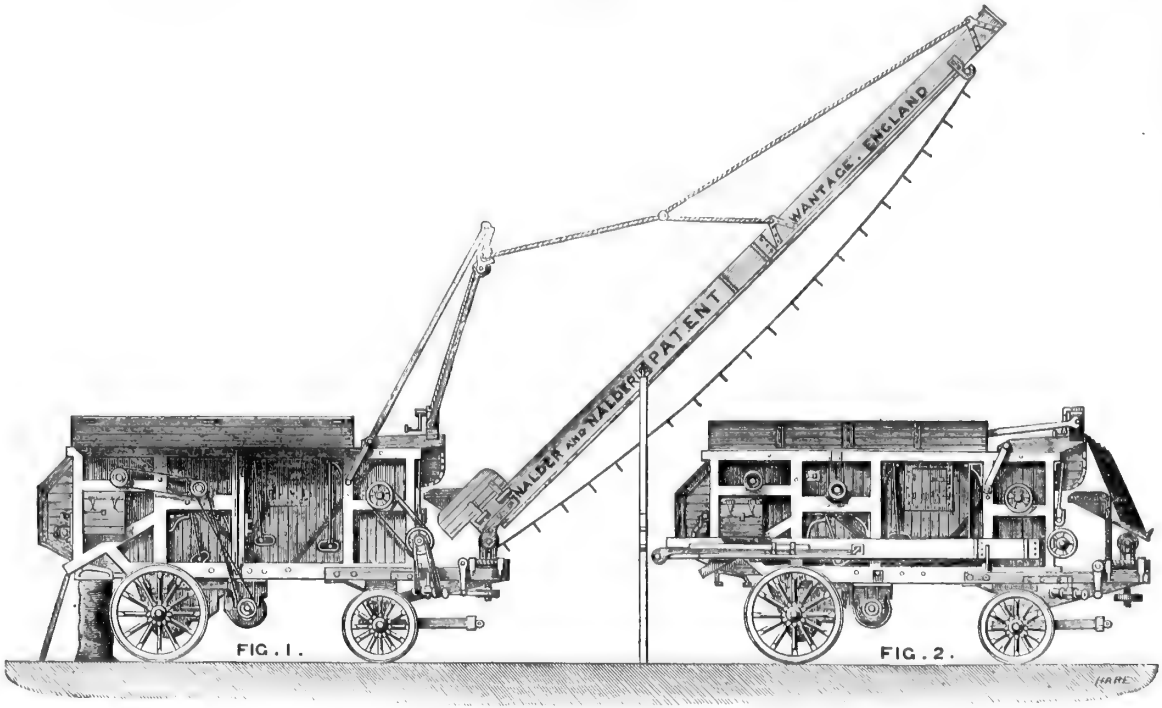
awarded first-class mention for a great improvement in band-saw machinery (Knowling's patent). The great peculiarity of this machine is that the standard moves, altering the angle of the saw, whilst the table maintains a horizontal position. This allows of timber being cut at any angle. The saw can be canted to an angle of 45 degrees. The table is fitted on rollers to follow the saw; hence the saw does not drag the timber along the table, as is the case with most band-saw machines. The main frame has trunnions at its base, is journalled in the foundation-frame, and is moved by a screw underneath the table, worked by a hand-wheel, which cants the screw and moves the table at one and the same time. Another important feature in this machine is the way in which the top saw-wheel is bracketed to the standard, by means of a pivot, and supported by indiarubber tension-springs. The adjustment by a hand-screw is very sensitive. The arrangement for adjusting the plane of the upper band-pulley, so as to make it coincident with the lower one, is simple and good. Any small obstacle getting between the saw and the pulleys does not break the saw. The machine is made in three sizes, and was catalogued as follows:—

Size.	Diameter of Driving Saw Wheel.	Depth with Cut.	Diameter of Driving Pulleys.	Average Power required.	Price.
					£
No. 1	30 Inches	10 Inches	12 Inches	Half horse	45
„ 2	36 „	13 „	14 „	One „	55
„ 3	42 „	18 „	16 „	Two „	75

Messrs. Nalder and Nalder, Limited, have introduced into this country a much-desired combination, viz., a portable combined threshing and straw-elevating machine. Something of the same arrangement has been used in America, but only, as far as I know, capable of delivering the straw in the same direction as that in which the machine stands, whereas this can be worked with equal effect at any angle. Moreover, the frame of the elevator is so jointed that it can be folded very snugly for travelling. The following illustrations (Fig. 28)—showing 1, the machine as fixed for work; and 2, as packed up for travelling—will give an idea of the appearance, and assist the reader to understand the means by which this desirable result is obtained.

The elevator is affixed on the straw-delivery end of the threshing-machine, being mounted on a horizontal axis, which allows the delivery-end of the trough to be raised or lowered, and on a vertical axis, admitting of a lateral or side-motion; and the

Fig. 28.—*Illustration of Messrs. Nalder and Nalder's Portable Combined Threshing and Corn-elevating Machine.*



apparatus is so constructed that the operation of raising or lowering the trough, or of adjusting it laterally, can proceed whilst the elevator is in motion. It will be seen by reference to Fig. 28, that a table or platform is attached to the main frame of the threshing-machine. The upper portion of this table is mounted, so as to be capable of rotation, or partial rotation, on a pivot. The lower end of the elevating trough is hinged to the upper portion of the platform in such a manner that the trough can be raised or lowered, the means of actuating the trough being a crane or winch fixed to the upper frame of the threshing-machine, with suitable pulleys, over which a rope or chain, wound at one end on the drum of the crane, and attached at its other end to other ropes or chains attached to the delivery-end of the trough. The rotation of the elevator is effected by means of a worm and worm-wheel. The endless web and chain of the elevator are driven by a pair of spur-wheels on the end of an upright shaft, to which motion is communicated by pulleys and belts from the threshing-machine, the arrangement being well shown in Fig. 28. In order to ensure stability in any required position, adjustable props may be used, one of which is shown in Fig. 28. In order to facilitate the packing up of the elevating trough the sides are detachable. The regulations of the Society preclude the awarding of medals without an adequate trial, for which there was no opportunity at Kilburn, otherwise I think the merits of this invention or combination might have justified such a distinction. The advantages claimed by the patentees are:—1. Saving of labour, inasmuch as the straw can be delivered in any position, or waggons may be loaded without stopping the machine. 2. Saving of time in starting machinery, as there is no time spent in fixing and setting the elevator. 3. Saving of power, owing to a peculiar arrangement of the prongs or tines, which are separately attached to each belt. 4. Saving of horse-power in removing from place to place, and of an extra attendant. The additional weight of the attached elevator is under half a ton, whereas an ordinary elevator weighs from 25 to 30 cwt. 5. Equal advantage when the implement is drawn by a traction-engine. 6. Greater facilities for working in a barn. 7. Saving of shed-room when stored. The price of the elevator varies from 40*l.* to 45*l.*, according as it is attached to medium or large-sized machines. Its addition to old machines of Messrs. Nalders' make involves an additional charge of 5*l.*

Messrs. Christy and Co.'s incubator has been already noticed.

No. in Catalogue.

2. *Second-Class Mention.*

4131 M. François L'Heron, for Agricultural Barrow.
6927 Pulsometer Engineering Company, for Centrifugal Grinding and Sifting Mill.
7368 Messrs. Entwisle and Kenyon, for Riley's Patent Engineer's Vice.
9056 Messrs. Everett, Adams, and Co., for Patent Double-row Turnip Thinner.
9144 M. Nicolas Noel, for Valve attached to Pump.
9714 Mr. Thomas Adams, for Patent Spring Safety-Valve.

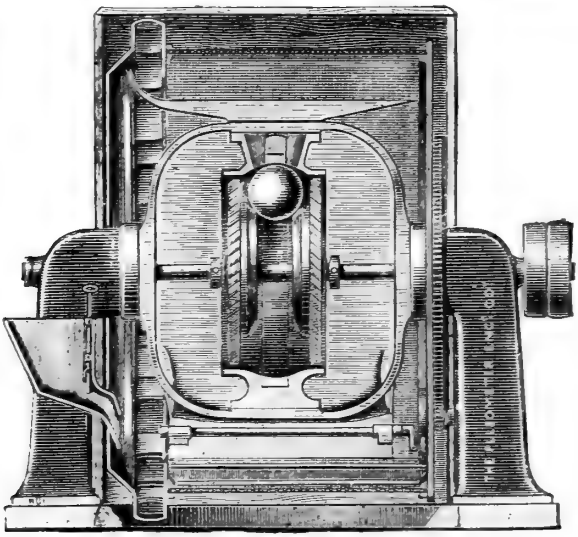
Messrs. J. Sabatier and Co., of Bread Street Hill, London, showed M. François L'Heron's universal barrow, for which are claimed special advantages. The shafts are high, and therefore the workman is not obliged to stoop. Part of the load bearing directly on the wheel, some considerable portion of the weight, said by the inventors to be 30 per cent., is thus saved. When unloading, the load is thrown forward over the wheel, and the load automatically opens the front flap, and is discharged, thus saving the trouble of turning the barrow over on one side, which is dangerous, and likewise requires more room. This article was not entered in the catalogue, and therefore I have no knowledge of the relative cost. That there is some advantage in the position of the load over the wheel and the mode of discharging is evident; and if equal strength without undue cost is obtained, this is a creditable invention.

The Pulsometer Engineering Company, of Queen Victoria Street, London, exhibited a complete novelty in their comminutor (Thompson's patent), a centrifugal grinding and sifting mill. The nature of the machine will be understood by reference to the sectional view (Fig. 29, p. 736).

The grinding is effected by the centrifugal action of the ball, which revolves with the spindle, and the revolutions of the discs. The spindle, which is driven at a high speed, when rotating carries with it the discs and the ball. The material to be ground or pulverized is placed in the external hopper, seen on the left side of the section, and fed from thence according to its nature, and by a controllable feed, into the cups of an annular elevator, by which it is raised and discharged into the internal hopper, from which it falls into the mill by double apertures; It is first crushed by the rapid blows of the ball, which freely exerts its centrifugal force upon the materials under operation; and by means of a simple rolling motion kept up by the discs the whole becomes rapidly pulverized, and is then, through the fans of each disc, raised out of the mill and falls into the sieve, through the meshes of which the fine flour escapes, whilst the coarser materials are brought back to the elevator, to be again

raised and reground. There is much merit in this machine; the wearing parts are not liable to serious wear, and renewals can be made with facility. The way in which the action is obtained is ingenious. This combines the blow of the stamper with the triturating action of the pestle. The position of the mill inside its own sifter is also a great advantage, as it ensures the delivery of a completely prepared article. Another point, upon which some stress is properly laid, is that the powdering action does not depend upon the momentum of the substance to be powdered, but that it is actually pounded and rubbed between surfaces of chilled iron and steel. As compared with

Fig. 29.—*Sectional View of Thompson's Patent Comminutor.*



edge runners, the Concessionnaires declared that the comminutor shows a large increase in the out-put for the horse-power employed. And as regards horizontal stones, there is the entire saving of dressing, and greater results with half the horse-power required for grinding. The claims are :—

1. That the mill can be run at a comparatively slow speed, and therefore wear and tear is reasonable.

2. That the grinding and sifting are thoroughly done at one operation.

3. That the wearing parts are easily renewed when required. The ball, the path on which it travels, and the discs, are made of hard chilled iron. The ball by rolling wears itself true, and

the bearing parts are so made as to be readily renewable. The shaft is of steel, and all the bearings are carefully protected against dust. There were two mills shown at Kilburn, the smaller one priced at 50*l.*, the other 160*l.* I should imagine such a mill would be valuable and economical for grinding coprolite, phosphates, &c.

Messrs. Entwisle and Kenyon, of Accrington, received second-class mention for Riley's patent engineer's vice, remarkable for strength and simplicity. It comprises a sliding vice with parallel jaws, which can be adjusted so as to receive nearly any article by merely pushing the outer jaw in direct with the hand, and then tightening the grip by turning the handles through a half circle. A vice spindle ending in a cam carries, above, a loose serrated grip-piece, which, on the handle being turned, locks into a corresponding saw (serrated piece) on the inside and above it. Directly it thus engages, the screw thread draws the outer jaw in, and fixes the object with a grip which is certain. Any size of work can be dealt with, and there is nothing to get out of order. Four different entries were made, viz., No. 1 J. Riley's patent joiner's bench-vice, price 16*s.* This can be changed instantly from $\frac{1}{32}$ inch to 1 foot, and *vice versa*, by half a turn of the handle. The other entries were :—

No. 1 E. Patent Engineer's Vice, 4½-inch jaws. Price 2*l.* 10*s.*
No. 2 E. ditto 6-inch jaws. Price 5*l.*
No. 1 S. ditto 4½-inch jaws, on double stand, with wheels. Price 5*l.*

Messrs. Everett, Adams, and Co. exhibited a complete novelty in their "Simplex" turnip-thinner, which very deservedly received second-class mention. It is a matter of regret that circumstances precluded a trial, as the apparent merits of the machine would probably have earned for it a silver medal. In these days of labour-difficulties, any mechanism that facilitates operations which have hitherto required skilled labour, are of great value. The Simplex imitates more closely the action of the hand-hoe, than any invention I have seen. The drawings (Figs. 30, 31) represent the front and side elevations.

It will be seen that an iron frame is supported by travelling wheels, the tires of which have a central rim and cross spuds, to prevent slipping. The axle carries a large bevel wheel, which engages a pinion on one end of a shaft, which terminates with a disc fitted with a crank-axle, to which are attached the coupling-rods carrying the hoes; to the end of these rods are jointed upright rods which are socketed to the frame, and can be raised or lowered by a lever handle with segments, seen in Fig. 30. It will be seen that by this arrangement each hoe can be raised or lowered when the machine is in motion, as each hoe works independently of the other. Owing to the attachment to the disc, the face of each hoe as it recedes from its cut is pitched downwards, so as to discharge any adhering soil. The distance between the plants depends upon the size of the hoes and of the

Patent 'Simplex' Double-row Turnip Thinner.

Fig. 30.—*Front Elevation.*

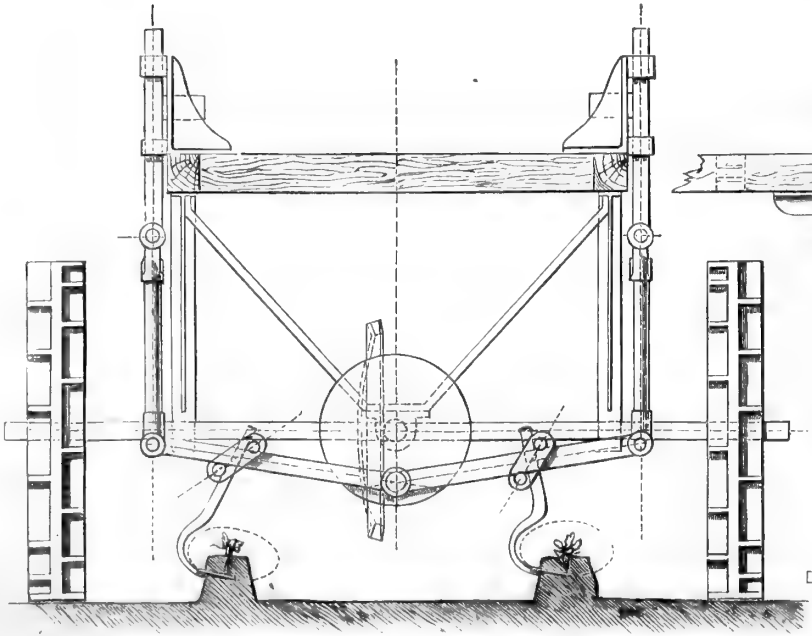
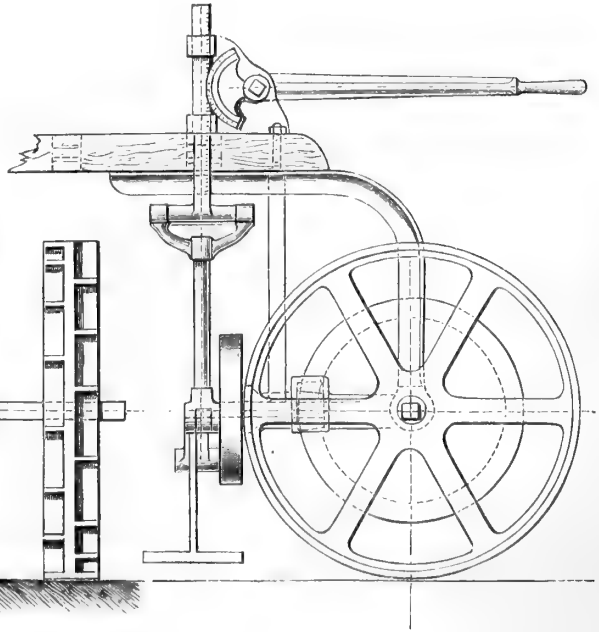


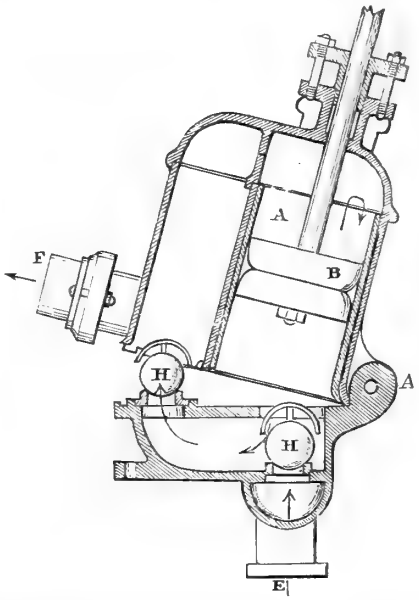
Fig. 31.—*Side Elevation.*



pinions; four different sizes, varying from 11 to 8 cogs, are supplied. The 11-cog pinion is to work with the large hoe, the 10-cog with middle hoe, and the 9-cog with the smallest hoe, the 8-cog pinion with the smallest hoe, when it is desirable to cut very close. The pinions are readily replaced; and to adjust the bevel wheel, all that is necessary is to slack back the collar on the boss of the bevel wheel, and shift the same for a pin to screw into a hole, farther from or closer to the wheel, as the case may require. The hoe-blades are fixed to stems, which can be shifted along the coupling-rods to suit any width of ridge. The road-wheels are also capable of expansion. The machines can deal with drills from 18 to 30 inches apart. They are made either for single or double rows; the latter are decidedly more economical. Price from 8*l.* 10*s.* to 10*l.* 10*s.*, according as single or double action is preferred. The hoes will remain in any position they are put in, without the attendant retaining hold of the handles. This implement has already gained several medals, and I regard it as a valuable invention at this time, and a decided advance upon previous efforts.

Mons. Nicolas Noel, of 60, Rue d'Angoulême, Paris, received second-class mention for the valves of a force-pump, and for the very simple manner in which, by unscrewing four bolts, the upper portion of the pump can be opened and the working parts got at. This will be seen at a glance by the following sectional drawing.

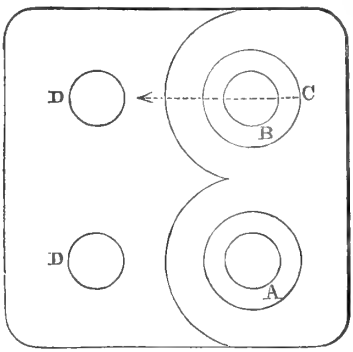
Fig. 32.—*Section of Mons. Nicolas Noel's Force-pump.*



The upper casting is hinged to the lower at A. The suction- and delivery-valves are shown at H H. The ball-valves are either of vulcanised india-rubber, or, for greater force of discharge, metal is used. They are 2 inches in diameter, over 1½-inch apertures. The seats are screwed in. The barrel is 5½ inches diameter. The maximum stroke is 5¾ inches. Thirty revolutions per

minute. The pumps are double-action, and deliver 2640 gallons per hour at any height. With india-rubber valves the water can be forced 24 yards vertically, and 28 yards horizontally. Hence it forms a powerful fire-engine. The action of the pump will be further understood by reference to the plan (Fig. 33).

Fig. 33.—*Plan of Mons. Nicolas Noel's Force-pump.*



A, Suction-valve under piston; B, Suction-valve under ditto; C, Passage from top of piston; DD, Delivery valves.

The merits of this pump are its simplicity, the durability of the valves, easy access to all parts, and perfect action; the muddiest water does not cause it to choke.

The universal pump for liquid manure, fire extinction, and watering purposes, is supplied, carriage-paid to London, for 13*l.* 15*s.*, and comprises:—

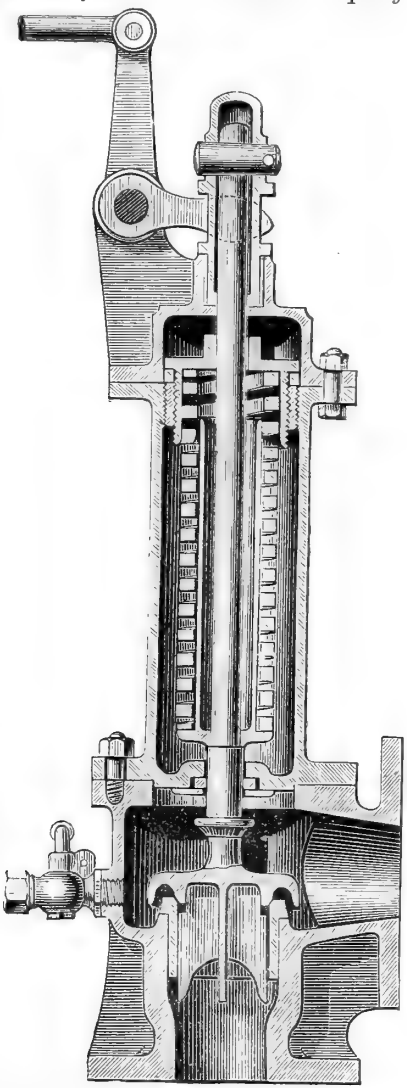
The pump, mounted on an iron two-wheeled carriage.
2¼ yards of spiral wire rubber-suction hose.
2 brass unions, one bent union, and an iron strainer.
4 yards of canvas delivery-hose, with brass double-union.
1 delivery-jet and fan-spreader for watering purposes.

Mr. Thomas Adams, of West Gorton, Manchester, exhibited several spring safety-valves. I am indebted to Mr. Courtney for the following description, and to the exhibitors for the illustration, which shows a section of the valve and spring.

The special feature as compared with the ordinary mushroom safety-valve is, that the head of the valve, instead of merely covering the valve-seating, is made to extend over the seating. This is well seen in the section. By this means, as soon as the steam pressure in the boiler has risen sufficiently to lift the valve, the escaping steam compresses on the outer ring, and, owing to the increased area exposed to the pressure of the steam, the valve is lifted still higher, thus rapidly relieving the boiler

of undue pressure. So soon as the pressure is reduced, it at once closes. In November 1878 this valve was awarded the

Fig. 34.—*Section of Mr. Thomas Adams's Spring Safety-valve.*



100*l.* prize offered by the Editor of the 'Nautical Magazine.' There were eight competitors. The following Report appeared in the 'Nautical Magazine' of November 1878:—

"Duration of test, one hour.

"The whole of the steam generated had to pass through the valve, and the following is the result:—

"On the gauge showing 60 lbs. the valve went off. The gauge instantly started to go gradually back to 59·4 lbs., when the valve closed tight; the time occupied being 13 seconds, and the mean difference between the greatest and least pressures being 0·6 of a pound. (There being no accumulation whatever.)

"The valve repeated this cycle of operations during the hour's test with unvarying regularity of pressure and time.

"The time was taken simultaneously by all the arbitrators from a 15-inch diameter dial clock fixed on the wall, having a second-hand moving round its periphery, and they were unanimous in awarding the prize to 'Vena Contracta,' which has since been claimed as the valve of Mr. Thomas Adams, of Manchester."

A boiler was under steam during the Show, fitted with one of these valves, in which the pressure was very uniform, a quarter of a pound excessive pressure at once opening the valve, which closed promptly as soon as the pressure had fallen a quarter of a pound below the point at which the valve was set to blow off.

Although unnoticed by the Judges, I have been requested by them and the Stewards to draw attention to the hurdles made

Fig. 35.—*Junction of Bottom Rail with Upright.*

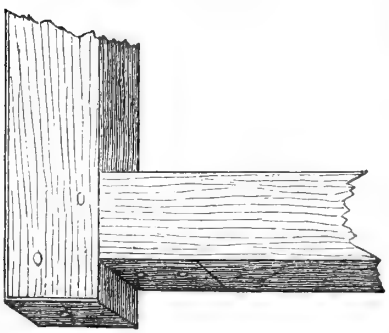
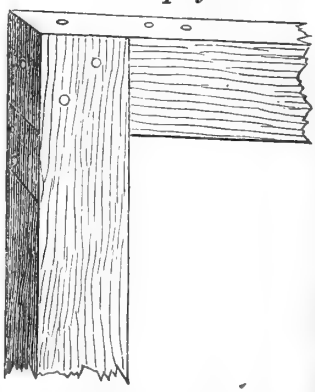


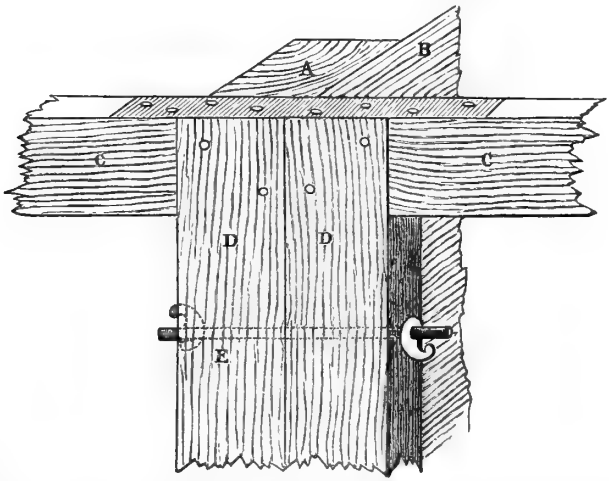
Fig. 36.—*Junction of Top Rail with Upright.*



by Messrs. William Glover and Sons, of the Eagle Works, Warwick, which were designed by the Society's Surveyor, as an improvement on those used for the exhibition of sheep and pigs in connection with the Paris Universal Exhibition last year, and which were employed with such manifest advantage for the pig-pens at Kilburn. Though readily removable, they make, when properly fixed, a very strong inclosure. They are light in appearance, and provide abundant ventilation. The simplicity of the gates fixed in the centre of each 9-feet hurdle, and their perfect efficiency, are very noteworthy.

The dimensions of each pen were 9 feet by 6 feet, each hurdle being 3 feet 6 inches high, composed of a framing of deal 4 inches by 1½ inches, the junctions being additionally secured by stout hoop-iron straps, fastened with 1-inch screws, the holes being countersunk. Fig. 35 shows the junction of the bottom rail with the upright, and Fig. 36 that of the top rail-posts; these are 3 inches by 3 inches, and are driven in at the corners, which gives great strength. Fig. 37 shows the bolt connecting two hurdles, the position

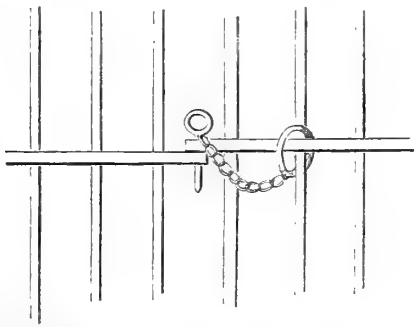
Fig. 37.—*Connection between two Hurdles.*



of the post, as well as the broader division between two pens. A is the top of the corner-post; B the boarded division between two pens; CC the top-rails; DD the uprights; E the bolt with screw-heads for fastening two hurdles; a similar bolt is used at the bottom.

Upright iron rods, $\frac{7}{16}$ of an inch in diameter, are fixed between the rails, 3 inches apart from centre to centre, having a supporting-bar in the centre

Fig. 38.—*Fastening of the Hurdle-gate.*

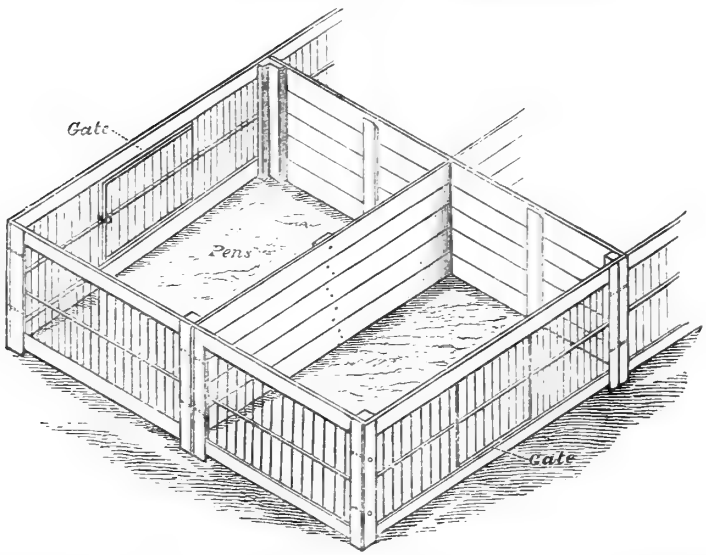


through which they pass. This completes the ordinary 6-feet hurdle; but where a gate is introduced, the clapping-post is a ½-inch rod, replacing the ordinary wire; and the hanging-post, of similar thickness, is allowed to revolve. The

gate-bars terminate both above and below in ½-inch rails. The middle-bar being extended, and coming above the middle-bar of the fence, affords the means for fastening with a pin and short chain. This will be understood by Fig. 38.

The effect of this very excellent arrangement will be seen at a glance by the subjoined isometrical view of the hurdles as fixed (Fig. 39).

Fig. 39.—*Isometric View of the Hurdles as fixed.*



The price given in the Catalogue is from 1*s.* 8*d.* a yard. I conclude that this represents the cost of the ordinary hurdle without gate—the gates, bolts, &c., being additional.

I have briefly alluded to the portable railway and train service of Messrs. John Fowler and Co., of Leeds, which did much useful work in conveying visitors from one end of the Showyard to the other. Some further details as to this valuable invention will not be out of place. The apparatus was originally invented and patented by M. Decauville, of Petit-Bourg, France. Messrs. Fowler, in undertaking the English trade, have greatly improved the details. The principle which pervades the system, and gives it distinctive features, is the distribution of the load on a number of small light waggons (each vehicle seldom carrying more than half a ton). This allows of the use of a light rail, so that the lengths of rails are easily moved about. The sleepers, placed 3 feet 6 inches apart, are made of corrugated steel. The attachment between the rails and sleepers is effected by a coupling-bolt, which makes a very strong connection, and ensures rigidity of gauge. No more thorough

test could be suggested than the yielding mud at Kilburn. Yet the gauge and connections remained intact throughout. The rails of steel are made in three strengths—of 10, 14, and 18 lbs. weight per lineal yard. It has been found that iron rails, originally employed, will not answer, as they bend too much on soft ground under the influence of a load. Three gauges are made, viz. 16 inches, 20 inches, and 24 inches, according to requirements. The 16- and 20-inches have been chosen as the most rigid and portable, because a man, by placing himself between the rails and grasping one in each hand, can carry a length, the weight of which does not exceed 1½ cwt. Each rail is thus secured: a wrought-iron chair is riveted to the sleeper, which fits over the flange, and against the outside of the rail a hooked bolt is passed through the corrugation of the sleeper under the rails, and the hook holds the inside flange of the rail, and presses it firmly against the chair. All that is required in fixing the railway is to see that the rails are laid upon the sleepers against the chairs, and the bolts tightened up, care being taken to keep the ends square. The price of the 20-inch-gauge rails is 3*s.* per yard. A variety of carriages for the conveyance of farm-produce are also supplied at reasonable rates. When operations are conducted on a large scale, such an apparatus must, I think, prove highly advantageous for the transport of the root-crops, carting manures, &c.

Amongst other novelties exhibited by *Messrs. Fowler and Co.*, was a patent scoop, designed for the making of ponds. This is specially exported for Australia, for which colony it was designed. The merit of its invention is mainly due to Mr. Peter Waite, the pasture manager for Sir Thomas Elder, of the Paratoo Run, South Australia, who, finding it impossible by manual or bullock labour to excavate to any great depth, so as to secure a proper supply of water for a dry country, turned his attention in 1875 to the application of steam-power to the formation of deep artificial water-holes; and, in conjunction with Messrs. Fowler and Co., devised and patented the scoop, which has since been considerably improved, until at the present time it is a very efficient machine. It should be mentioned that, previous to the introduction of the scoop, the greatest depth that could be practically reached was about 12 feet. Now double that depth, and probably more, is obtainable; and this, in a country where the evaporation frequently reaches 4 to 6 feet per annum, is a point of immense importance, securing thereby, not one, but three years' supply of water, and practically insuring a permanent water-supply. The method of working may be shortly described:—Two winding-drum self-moving engines of 16-horse-power are used; the one engine is placed on the edge of the dam, the other on the

bank some distance back from the opposite edge, so as to allow space for the deposit of the earth; also a strong balance-plough capable of carrying four shares on each side; and the scoop, which is bell-mouthed, 7 feet 6 inches at the mouth, and 6 feet broad at the narrowest point, 6 feet from back to front, and about 4 feet deep at the shallowest part, and which, when full, holds $2\frac{1}{2}$ cubic yards of soil. The removal by plough and scoop of 2000 cubic yards per week is considered fair work. The ploughs are first employed to tear up the soil at the bottom of the dam to a depth of 10 or 12 inches. The soil is frequently, owing to drought, as hard as a road, and could not be touched by ordinary means. When the surface has been ploughed, the scoop is substituted for the plough. It is drawn forward by the engine on the bank into the loose clay, and when full drawn back and up the side of the excavation by the other engine; and then at a suitable distance it empties itself, and to some extent spreads the material as it is discharging. The cost of excavating a dam to 12 feet, which was the greatest depth possible by bullock labour, ranged from 10*d.* to 1*s.* a cubic yard. The steam-plough and scoop, when in fair working order, can excavate to a depth of 24 feet, at 6*d.* a cubic yard. Mr. Waite considers that a depth of 30 feet might be reached without inconvenience or undue strain on the machinery. A team of bullocks are required to bring fuel (wood), of which about 2 tons a day are consumed, and eight men are required. The cost of the whole plant, delivered at Port Adelaide, was 3000*l.* When it is remembered that the country in question is utterly useless for summer grazing without a supply of water, the immense advantage to the sheep-farmer of being able to sink these deep artificial lakes can scarcely be overstated; and there can be no doubt that the difficulty as to the occupation of a dry country has been solved, and that large areas, which would otherwise have been worthless, may now be stocked, through the work that can be done by the steam-scoop. The Catalogue price of the scoop is 220*l.*

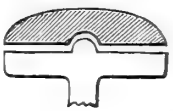
As a matter of small detail, mention may be made of a somewhat novel and ingenious method of expanding the frame of a horse-hoe (Article No. 5156), shown by *Mr. William Gilbert*, of Shippon, Abingdon, Berks, so arranged that the alteration can be instantly made without stopping the horse. This is effected by means of a turntable-disc with two eccentric pins, to which arms are pivoted which actuate the frames. A lever-handle from between the stilts, held in place by a rack, enables the attendant to move the turntable. A friction-wheel behind the frame, on a swivelling axle free to move, is held in a backward position during work, by means of a trip. When the trip is removed,

the wheel assumes an upright position, raising the frame for turning at the headlands or travelling. A one-row hoe can be made to expand from 10 to 20 inches. Price, 3*l.* 10*s.*

A novelty deserving description was shown by *Mr. John Dobbings*, of Fighting Cocks, near Darlington, viz., an iron-frame and steel-wheeled cart for farm purposes, ranging in price, according to the load to be carried, from 15*l.* to 17*l.* 10*s.*

The body is carried on a cast-steel horn or axle-box; each side is stayed to the frame by $\frac{1}{2}$-inch rods; the top and bottom frames are made of $2\frac{1}{2}$ by $\frac{3}{8}$ angle iron; two cross frames of T-iron are drilled to receive screws for boarding with countersunk screws; the block is recessed to receive the axle; a rubber buffer is placed between the top of the block and the cart; this is an important feature, relieving the horse from the jar, which would be felt more perhaps with an iron than a wooden cart. The spokes are of semi-oval drawn tubes. The ring of the wheel is cast in four parts and put together. The spokes are cast into the outer ring and into the nave; a $\frac{1}{16}$-inch space is left in every joint of the rim; then the tire is put on by the ordinary plan. A concave and convex arrangement is introduced to hold the tire, which will be understood by the illustration (Fig. 40). The cast rib, 1 inch deep in the centre of the ring, gives great strength. When the tire is shrunk it takes up the $\frac{1}{16}$-inch spaces, and brings each spoke to its own work. The axle is of steel, 2 inches in diameter. The weight of the cart shown, which was calculated to carry 30 cwt., and priced at 16*l.* 10*s.*, was 9 cwt. 3 qrs; the bottom and sides were of red deal. The capacity was as follows: bottom, 5 feet 2 inches in length by 3 feet $3\frac{1}{2}$ inches in width; top, 5 feet 9 inches in length by 3 feet 7 inches in width; depth, 14 inches, increased by side boards to $19\frac{1}{2}$ inches.

Fig. 40.



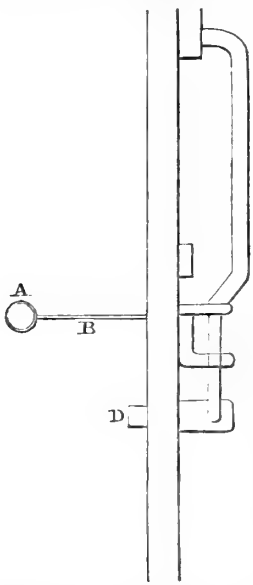
As a matter of small economy, a good oil-can for lubricating machinery is of importance, and such was shown by *Messrs. Joseph Kaye and Co.*, of Kirkstall, near Leeds, made in six different sizes, and ranging from 1*l.* 2*s.* to 1*l.* 10*s.* per dozen. The mechanism differs from ordinary cans in the fact that the valve, by the movement of which the oil escapes from the can into the spout, opens outwards, pushing the oil out as required; therefore there is no limit as to the size of the spout. A small perforated plate acts as a filter, and collects any impurities in the oil used. A pair of lock-nuts regulate the discharge. The top of the can being dished, it collects all droppings when the can is filled.

This Report would be incomplete without a short notice of certain novelties or improvements in machinery for steam-cultivation introduced by *Messrs. Everett, Adams, and Co.*, of St. Andrew's Works, Ryburgh, Norfolk, of which the Judges took considerable notice, but, inasmuch as no opportunity occurred of making a trial, they considered official notice would be premature. It should be stated that Mr. Everett, before commencing to manufacture, had many years' practical experience of the working of steam-cultivating machinery.

The novelty as regards the engine consists in the use of two vertical winding drums, which are mounted on either side of the boiler, and are driven directly from the crank-shaft of the engine. The use of two drums is for roundabout cultivation; if intended for the double engine system, one drum only will be required to each engine. The hauling drums are mounted loosely on stud axles made fast to the skin of the boiler. They are cast with a ring of spur teeth into which gear pinions, which slide on feathers on the crank-shaft. This shaft is mounted above the barrel of the boiler, and carries two spur-wheels of different sizes, which gear into wheels on the counter-shaft, for giving two different speeds. On one end of the counter-shaft is a spur pinion, which gears into a spur-wheel keyed to one end of a second counter-shaft, which carries at its opposite end a spur-pinion for driving, through a spur-wheel, the axle of the traction wheels. This is strong, simple, and direct gearing. This arrangement, moreover, allows of the winding-drums being placed close to the boiler, so that no extra width is required. The ropes as they leave the drum may be led off in any required direction. As regards the roundabout system, this invention removes the necessity for a separate windlass. A strong india-rubber pad is placed between the boiler and the fore carriage. The catalogue price of a 10-horse-power engine is 580*l*.

The improvements in the travelling anchor, which in its main features resembles that of Campain, consists in the addition of a semaphore or other signal, and the action of a movable lever rod, which, when pressed in by a ball or other opposing medium on the rope, causes a stop to be withdrawn, and thus liberates the axle carrying the claws, and allows the tension of the rope to move the anchor forward on the head-land, at the same time acting on the telegraph arm, which flies out, notifying to the engine driver that the cultivator has completed a "bout;" and he will continue the action on the hauling rope to move forward the anchor, until a signal from the man on the cultivator warns him to stop the progress of the anchor and reverse the engine. The effect of this reversal will be to release the swinging frame from pressure and to cause the semaphore arm to drop (Fig. 41). A, Telegraph standard; B, leverage rod, connected with C, the movable bar. The end of the movable bar acts on a stop, D, which prevents the claws moving. When the ball on the rope comes in contact with the bar, C, the latter is pushed in, withdrawing the catch, D, and liberating the claw, which no longer keeps the anchor fixed. At the same time the telegraph arm goes out, and remains so whilst the anchor travels. The price of this article is 50*l*.

Fig. 41.—*Semaphore for Steam-cultivation.*



The third and last invention or improvement that I shall notice relates to a snatch block, which is capable of being traversed along the road to its work. It consists of a frame, made of bar-iron, bent at its rear end into the form of a triangle (see A A, Fig. 42), and continued forward to form a forked bearing for a roller, B. Between the fork and the triangle the frame is fitted with a stud-pin, C, for receiving the guide pulley, D, around which the hauling rope for the engine is passed. Mounted on the triangular portion of

Fig. 42.—*Plan of Snatch-block and Roller.*

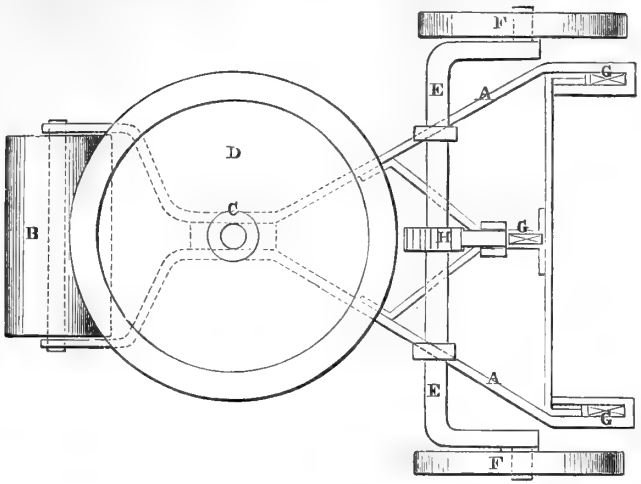


Fig. 43.—*Elevation of Snatch-block and Roller while travelling.*

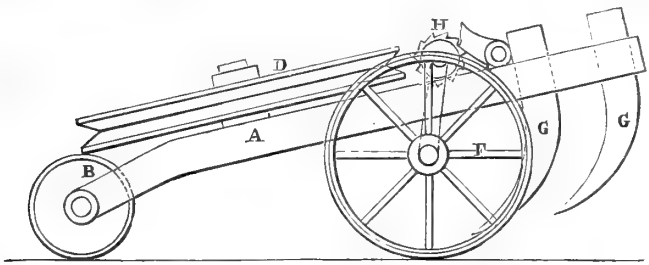
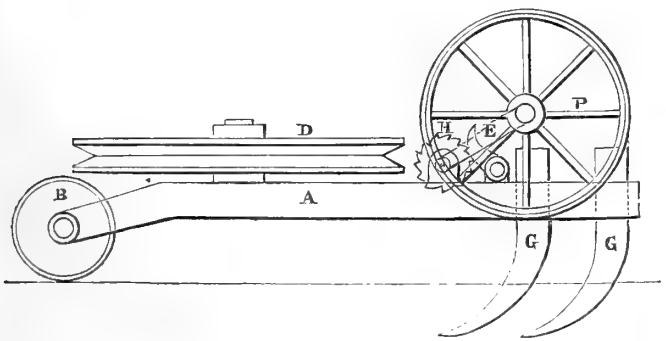


Fig. 44.—*Elevation of Snatch-block and Roller while at work.*



the frame is a transversed crank-axle, E, to which is fitted a pair of travelling wheels, F. At the rear of the frame are claws or tines for entering into the ground. The travelling wheels when in use hold these tines out of the ground, their cranked shaft being locked by a pawl on the framing, A, engaging in a ratchet-wheel, H, keyed on the crank-shaft. When the crank-shaft is unlocked, the tension put on the hauling-rope will draw the tines into the ground, the attendant can then lift the wheels out of the way, and secure them in the position shown at Fig. 44 (p. 749). The roller, B, prevents the front part of the frame from dipping into the ground and thus tending to lift the tines. By a modification of the arrangement the roller is done away with, a hinged frame being used to carry the guide pulley, and the tines are fitted to the crank-shaft instead of to the framing, and are thus raised or lowered by the direct action of the crank-shaft.

Of course without a proper trial it is rash to pronounce a strong opinion; but these inventions appear decidedly meritorious, and are therefore worthy of the short notice which has been given.

Messrs. Hornsby and Sons **introduced at Kilburn a novelty in their patent manure distributor. Although the Judges refrained from expressing an opinion, inasmuch as they had not any opportunity for a thorough and prolonged trial, which is absolutely necessary in order to prove efficiency, there are some features in this machine that merit notice.**

The barrel, which rotates, has spiral projections throughout its whole length; each of these projections is acted on by a scraper, which removes the manure. As they carry it from the box or hopper each scraper works independently, so as to be easily adjusted. The barrel is fixed on the main axle, and therefore revolves in the same direction as the road wheels, and is driven by a spring clutch to throw it in and out of gear. Owing to this peculiar arrangement the attendant can ride in front, a pivotted seat being provided for this purpose, and can see and control the action of the drill, instead of having to walk behind as formerly. A set of stirrers in the hopper, moving at a slow speed to and fro upon a plate, are intended to prevent the manure sticking; they are driven by a revolving cam on the main axle, and the plate and stirrers can be readily removed for cleaning. The manure as it falls from the barrel, drops upon a rotating distributor, with a view to its even distribution over the land. The advantages claimed are, that the slow speed of the barrel and stirrers, and the openness of the box, prevent the manure being so much worked up into a paste as is commonly the case.

The last novelty which I shall notice is Pooley's Patent Automatic Weighbridge, which, though specially adapted for railway purposes, might be equally applied for agricultural uses.

The object claimed to be attained by this invention is the rendering of lever weighing-machines automatic in their indications, without the intervention of springs, racks, sectors, or pinions. The weight is indicated by a finger rotated against a graduated disc, the finger being secured to a light spindle revolved by a very light and pliable chain. The principle is that of counterpoising the load, by means of a weight taken up by the extremity of the long arm of a lever, which weight increases or diminishes in effect, gradually, infinitesimally, and automatically. The indexing finger driving-chain is attached to the long-arm of the lever; any change in its

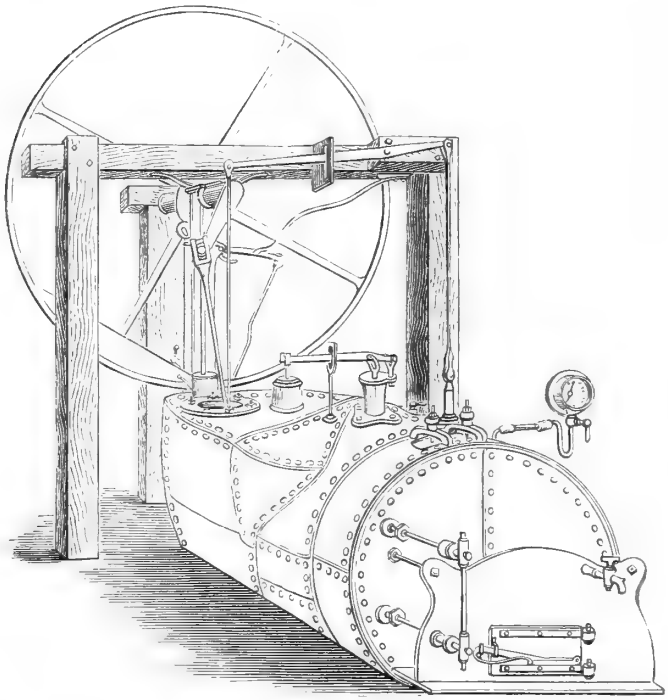
position therefore changes the position of the finger against the dial-face. The counterpoising weight is a hollow annular cylinder, closed at the top and open at the base. The sides are of sufficient thickness to displace an amount of fluid equal in weight to what is required to balance the maximum load to be weighed. The interior of the cylinder forms an air-chamber; the air being admitted or expelled through a valve provided in the cylinder cover. A cylindrical tank receives the counterpoising weight. The tank contains a fluid in which the counterpoising cylinder is almost submerged, having been first attached to the end of the long arm of the lever. Speed of weighing is controlled by the valve in the air-chamber cover. A load is brought on to the weighing-plate and immediately the weighing lever rises, lifting the poising weight with it, which continues to rise till the load is equipoised. The revolving finger then indicates the weight upon a scale marked on the disc. This is a simple and ingenious mechanism not likely to get out of order.

Ancient and Modern Implements.

The exhibition of ancient and modern farm implements, side by side, was a highly interesting feature of the Kilburn Show, illustrating more or less completely the extraordinary progress that has been made in a comparatively short period of time—a progress that has not been exceeded in any other department of productive industry. Looking at the highly instructive remains of a past agriculture, which, except some scheme of preservation is organised, will soon be lost to us for ever, I could not but regret that we have not, as one of our national institutions, a patent model museum, where it should be incumbent on every inventor, claiming protection for his invention, to deposit a properly constructed model on a fixed scale. We have, I am aware, a valuable Patent Museum at South Kensington, and I rejoice to know that the original Bell's reaper, and the Hussey's reaper, are there preserved; but the fact that these two machines, and one model of a digger, were the solitary representatives of the Commissioners of Patents, indicates how poor is our collection of bygone agricultural implements. We might well take a lesson from the American Government, who have a most interesting Museum of Patent Models at Washington, where can be seen every stage of invention, from the crudest combination to the latest perfection. Surely it is not too late to obtain models of all the more interesting exhibits at Kilburn, even if the originals are too cumbrous for preservation. And the Society will have done good service to the cause of national education, if its collection of curiosities at Kilburn should pave the way for a National Museum of Models. Every author is obliged to deposit copies of his work in certain libraries; why should not the patentee be equally required to deposit a working model of his invention? As it was, the Society was principally indebted to the kindness of private individuals for the loan of

such machines as were shown. The public were much indebted to Mr. W. Trethewy, of Grampound, Cornwall, for the sight of probably one of the first steam engines, if not the very first, ever used for farm work ; and the interest was further increased by the fact of its being shown in work. This engine was invented by the celebrated engineer Richard Trevithick, of Hayle, and was

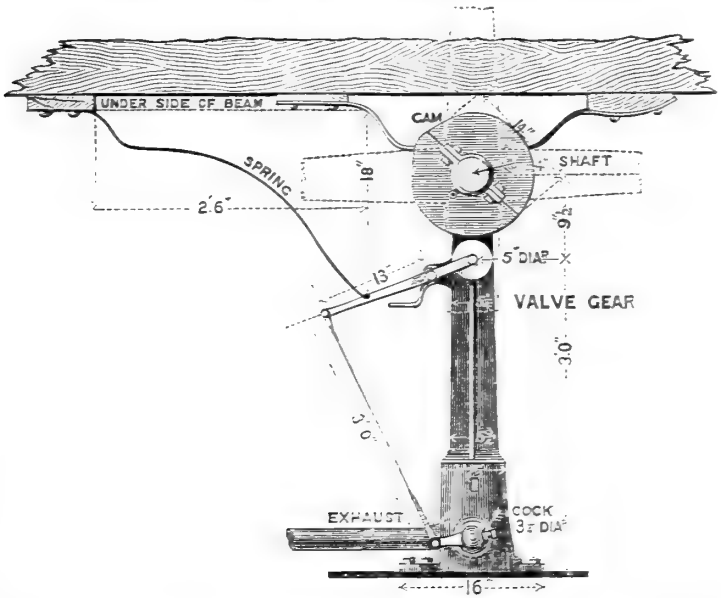
Fig. 45.—*View of Trevithick's Steam-engine.*



made for Sir Christopher Hawkins, Bart., in 1811, and fixed on his Home Farm, Trewithan Probus, Cornwall, for threshing corn, &c. It cost originally 80*l*., and has been in use ever since. Up to the time of the exhibition it was the property of C. H. T. Hawkins, Esq., of Trewithan, the nephew of the original proprietor; but I am very happy to say that it has been purchased by the Commissioners of Patents, to be preserved at South Kensington. The engine was worked at Kilburn by compressed air supplied into the boiler, the air being compressed by one of Sturgeon's patent air-compressors, kindly lent for the purpose by Messrs. Clayton and Venables.

For the drawings of the engine I am indebted to Mr. Maw, the editor of 'Engineering,' who has kindly lent the Society the electro; whilst for that of the valve gear I am indebted to the editor of the 'Engineer' for a similar drawing to that which appeared in the issue of June 20th (Figs. 45 and 46).

Fig. 46.—*Valve-gear of Trevithick's Steam-engine.*



By way of explanation it may be stated, that the cylinder is placed in the boiler, and is thus surrounded by a powerful steam-jacket, which is of great importance, as it is open at the top, and the cold air, which must of necessity enter with the piston in its downward descent, would otherwise cause considerable condensation. The piston was worked entirely by steam admitted below, forcing it up, whilst its descent was due to the balance-weight attached to an enormous fly-wheel. Instead of a slide-valve for the admission and emission of the steam, Trevithick used a two-way cock in a three-way shell. The cock is kept tight by a bent spring, the action of the spring being adjustable by means of vice-screws. This is shown in the second figure. The lever of the cock is acted on by a long crooked spring bolted to the framing, and this spring keeps a bowl 5 inches in diameter continually pressed against a cam-plate fixed on the crank-shaft. The necessary action on the steam-cock is brought about by the influence of the cam on the bowl acting on the spring, and the only way of stopping the engine consists in putting a wooden wedge or scotch between the bowl-lever and a piece of iron screwed to the frame for that purpose. This scotch must be slipped in when the exhaust-port is open and the steam-port closed. The bowl is thus prevented from following the cam, and the engine is stopped. The only way to regulate the speed is by altering the pressure of steam, and the slight adjustment of

the steam-cock by means of a hand-screw. The connecting-rod is coupled direct to the hemp-packed piston. Such is a brief description of what was probably the first high-pressure engine ever used for agricultural work. The rim of the fly wheel was grooved, and carried a rope by which the thrashing machine was driven.

The following letter was found after Trevithick's death in an old memorandum account-book; it refers in all probability to the engine shown at Kilburn:—

Hayle Foundry, February 13th, 1812.

To Sir Christopher Hawkins, Baronet.

Sir,—I now send you, agreeable to your request, a plan and description of my patent steam engine which I lately erected on your farm for working a thrashing mill. The steam engine is equal in power to four horses, having a cylinder 9 in. in diameter. The cylinder, with a moderate heat in the boiler, makes 30 strokes in a minute, and as many revolutions of the fly-wheel, to every one of which the drum of the thrashing mill, which is 3 ft. in diameter, is turned twelve times. The boiler evaporates nine gallons of water in an hour, and works six hours without being replenished. The engine requires only little attention—a common labouring man easily regulates it. The expense of your engine of 4-horse power compared with the expense of four horses is as follows:—

	£	s.	d.
Original cost of steam engine	80	0	0
Building material and rope	10	0	0
	£90	0	0
Interest on the above, at 5 per cent.	4	10	0
Wear and tear, at 5 per cent.	4	10	0
	£9	0	0
Original cost of horse machinery for four horses ..	60	0	0
Interest on the above, at 5 per cent.	3	0	0
Wear and tear, at 15 per cent.	9	0	0
	£12	0	0

Two bushels, or 164 lb. of coal will do the work of four horses, costing 2*s.* 6*d.* Four horses, at 5*s.* each, gives 20*s.* Cost of coal, 2*s.* 6*d.* as compared with 20*s.* for horses.

I remain, Sir,

Your obedient servant,

Richard Trevithick.

I am indebted for this letter, as well as for much of the description, to the excellent article in the 'Engineer' of June 20, 1879, in which the writer proceeds to question the accuracy of Trevithick's statement, that the boiler evaporates only 9 gallons per hour, and works six hours without being replenished,

realising with such expenditure a force equal to four horses, and thinks it probable that Trevithick meant 19 gallons instead of 9. But how the boiler could work for six hours without feed, or consume only 1 bushel of coal in $4\frac{3}{4}$ hours, which equals only a little over 5 lbs. per horse power per hour, appears an incredible result with such an engine. To a certain extent Trevithick's statement is borne out in a report of three gentlemen called in to see the machinery in operation :—

Cornwall, Feb. 20th, 1812.

Having been requested to witness and report on the effect of steam applied to work a mill for thrashing corn at Trewithen, we hereby certify that a fire was lighted under the boiler of the engine five minutes after eight o'clock, and at twenty-five minutes after nine the thrashing mill began to work, in which time one bushel of coal was consumed. That from the time the mill began to work to two minutes after two o'clock, being four hours and three-quarters, 1500 sheaves of barley were thrashed clean, and one bushel of coal more was consumed. We think there was sufficient steam remaining in the boiler to have thrashed from 50 to 100 sheaves more barley, and the water was by no means exhausted. We had the satisfaction to observe that a common labourer regulated the thrashing mill, and in a moment of time made it go faster, slower, or entirely to cease working; we approve of the steadiness and the velocity with which the machine worked, and in every respect we prefer the power of steam as here applied to that of horses.

(Signed) Mathew Roberts, Lamellyn.
Thomas Nankiville, Golden.
Mathew Doble, Barthlever.

The writer in the 'Engineer' suggests, in reference to the above, that possibly these gentlemen, as to whose knowledge of machinery no evidence appears, may have failed to notice or understand the use of the feed-pump which is now attached to the engine, and no doubt was then. Be this as it may, this great curiosity has been at work till within a very recent period, and, barring some repairs to the boiler, is precisely the same in form and operation as when first made by Trevithick in 1811.

In reference to steam cultivating inventions, the exhibition of ancient implements was disappointing, as the oldest, viz., Smith's windlass, only dates back to 1856; and, with the exception of a model of a steam digging machine, on the rotary principle, lent by the Patent Office, we find no illustration of the numerous inventions which led up to a practical result. Usher's plough, Bethell's rotary digger, Romaine's invention, Boydell's wheels, and the ingenious attempts of a tenant farmer, Mr. John Allen Williams—models of all these would have been highly interesting. The earliest of Fowler's inventions was a steam plough engine, shown by Mr. H. Pye, of St. Mary's Hall, Rochester, 14-horse power, built by Messrs. Ransomes and Sons, and was the first engine in which the steam engine and windlass

for ploughing were combined in one self-moving apparatus. This was first shown at Salisbury in 1857; it was provided with two horizontal winding-drums, carrying the two ploughing ropes and an additional small drum for a headland rope by which it hauled itself along the headland parallel to a self-moving anchor at the other end of the field. The engine had two cylinders, and the boiler was carried on wooden wheels. Subsequently the engine was altered three times. In 1858, the winding-drums were replaced by grooved drums, thus introducing the system of working with an endless rope. The next alteration consisted in substituting three drum-sheaves for two grooved-drums, the central one being worked by the engine. Finally, in 1861, the clip-drum was introduced, in which form the engine was exhibited. This history is interesting, inasmuch as it represents some of the principal alterations that have taken place. Even the clip-drum, which was such an advance upon its predecessors, has now given place to single winding-drums. Two curiosities in the way of steam ploughs were shown, viz., Fowler's 3-furrow steam plough, fitted with Kent wooden mould-boards. This was shown by T. Lake, Esq., Tony, Sittingbourne, and is described as one of the best steam ploughs ever constructed. And Fowler's original balance plough, lent by Mr. Edmund Ruck, Castle Hill, Cricklade. Though not one of the very first implements constructed by Mr. Fowler on the balance principle, it represents early efforts, having the straight wooden beams, and the separate plough-middle on two wheels, which carries the fulcrum for the right- and left-hand side of the implement, steered by means of the two central wheels, and slack-rope drums. The last of the ancient implements of Messrs. Fowler and Co. that I shall allude to is the Sutherland plough, very properly named after the noble owner, who has done a great work of reclamation. It is hardly right to class this as an old machine, seeing that it is of comparatively recent growth; but it well represents the progress that has been made, and the adaptability of steam power to a great variety of work. It was made in 1872, and was first worked by a roundabout tackle. Constant breakages occurred, and, at the suggestion of Mr. Wright, a large rotary knife was fixed in advance of the plough, cutting the sod, and lifting the implement over any rocks which came in the way. By the Duke's suggestion a subsoil tine of enormous strength was attached to the implement for tearing out stones. As a comparison with these more or less ancient machines, Messrs. Fowler and Co. showed a 16-horse power winding machine, a 6-furrow balance plough, a 11-tine turning cultivator, a turning harrow, and the present Sutherland plough, all indicating in material, workmanship, size, strength, simplicity of construction, and

suitability for their special work, the great advance which has been made in a period of less than twenty-five years.

Messrs. J. and F. Howard exhibited a windlass for working Smith's cultivator with a portable engine, made in 1860 for the Royal Farm, Windsor. Also a three-tine cultivator with Smith's patent turning-bow, made for the same purpose in 1859. Another of Smith's cultivators, made by Messrs. Howard in 1856, was lent by Mr. Whiting. By the use of the bow, to which the ends of the two ropes were attached, the implement was readily turned by the pull of the hind rope; but as there was no arrangement for lifting the tines out of the ground, an implement of great width was out of the question; nevertheless great credit is due to Mr. Smith for an invention which paved the way for the turning cultivator of Messrs. Fowler and Co., probably the most perfect implement for steam purposes yet invented.

It would have been deeply interesting and instructive to have seen more of the original designs for reaping by machinery; and in the absence of models, the diagram illustrating the various designs that have been the subject of experiments was well worthy of attention.

Bell's original reaper, which worked at the Glasgow Show in 1829 and received a prize, together with one of Hussey's reapers with tilting platform as shown in 1853, were exhibited by the Commissioners of Patents. It would have been very interesting to have had McCormick's machine, which was first introduced to the British public at the Great Exhibition of 1851. In the notice attached to Bell's reaper in the Catalogue, it is stated that a number of these machines were sent to America in 1834, strong evidence that to our countryman belongs the great honour of having been the original inventor of machinery which both here and in America are now such an absolute necessity.

It is further stated that a rotary cutting machine, by Smith of Deanstone, invented about the same time, in 1834, is still used by Mr. McQueen, near Stirling. It is much to be regretted that if this is so, the curiosity was not shown at Kilburn, because it represents a number of inventions on the same plan. Sir P. Miles, of Leigh Court, Bristol, showed a Burgess and Key's swathe delivery reaper of 1854, the identical machine which first beat Bell's, manufactured by Crosskill, of Beverley, at the Bristol trials after the Carlisle Meeting. This machine was an improvement on McCormick's original machine, and was specially distinguished by the means for self-swathe delivery by a series of rollers fitted with Archimedian screws. The Judges, Messrs. Huskinson and Clare Sewell Read, thus spoke of it in 1854:—

This machine cut a clear track of 5 feet 6 inches, and in every operation in which it was tested exhibited a decided superiority. It cut with great

precision both wheat and barley, standing and partially lodged; and in cutting through weeds and grass showed no tendency to choke. The delivery is peculiar to this machine, and is the principal and most important improvement since last year. The corn on being cut falls on a series of rollers fitted with Archimedian screws, by which it is delivered in a continuous and well-formed swathe at the side of the machine; and it was proved to be capable of cutting wheat and barley with no other attendance than a boy strong enough to drive a pair of horses. The draught also was much lighter than any other machine, and the horses were not required to travel faster, or exert greater power, than would be necessary in ploughing land of medium strength.

The really marvellous progress in this class of machinery in so short a time was seen by a comparison of those early inventions and the latest improvements of the Grantham firm, and more especially by McCormick's sheaf-binding machine, which proved so successful at Bristol in 1878. Much credit is due to Messrs. Burgess and Key for their early efforts to improve self-delivery reapers. Hornsby's and Wood's original mowers, and Bamlett's machines, completed this interesting section. The collection of ancient ploughs was very instructive; one, shown by Messrs. Perry and Barrett, of Reading, dates back to the beginning of the century; and all the great improvements could be seen. As far back as 1834 Messrs. Ransomes, Sims, and Head invented a double-furrow plough; and Messrs. Howard's two-wheel iron plough of 1840 is the type of all the later improvements. Messrs. Ransomes, Sims, and Head contributed an Egyptian and a Javan plough of very ancient types, and a Crimean three-furrow plough—the latter of much merit. The First Lord of the Admiralty and Sir Massey Lopes added much to the interest of the Show by the illustrations of Cyprus agriculture, from which I am led to hope that one advantage resulting from our occupation will be some improvement in farming practices, which are extremely primitive. Thus, for example, what is described by the rather comprehensive title of a combined threshing and chaff-cutting machine, consists of a board, the under-surface of which is studded with sharp flint projections. The corn being placed on a floor, this is drawn backwards and forwards by oxen. The driver, dancing on the board, urges on the beasts, and aids the flint-cutters to accomplish their work. A cart, innocent of iron, and of the flimsiest build, as well as a plough, were great curiosities. It is said that the latter indicates the embryo Kentish turnwrest plough, which it is supposed was introduced into this island by the Romans, and which, by the way, is still preferred for certain descriptions of land to any of the more modern improvements.

The stages of invention leading up to our present winnowing-machinery were well seen—first in a very ancient fan

comprising portions of sail-cloth hung on to a revolving frame, with a riddle and swing for the same. Then there was an improved fan worked in combination with a screen and riddle, which was common from 1780 to 1812, and was the precursor of Cooch's corn-dressing machine, made in 1800, and shown by Mr. H. Cooch, of Harlestone, the grandson of John Cooch, the original inventor of this class of machinery. It is stated in the Catalogue that this machine was sold to Mr. H. Higgins, of Cooknoe, near Northampton, in September 1800; at whose death it was transferred to his nephew, Mr. W. Higgins, of Houghton, Northampton. Upon the latter relinquishing farming it was sold to Mr. Warren, of Boughton Hill, near Northampton, who had it in constant use until its removal for exhibition at Kilburn. The machine is consequently nearly 79 years old ; and although it has been repaired and some improvements have been added, still the framework, and nearly all the fittings, remain intact; and it is still capable of dressing a sample of corn satisfactorily notwithstanding its great age. The truth of the adage, "That there is nothing new under the sun," received frequent confirmation at Kilburn. Thus, the collection of machines for slicing roots showed the germ of the highly finished composite machines of the present day. One of these, of which even the exhibitor is unknown, is described as a double-edged knife root-cutter, very old. The knives are fixed on a horizontal disc, and cut slices with one edge and finger-pieces with the other, so that by merely reversing the turning, the roots are cut into slices for cattle or into finger-pieces for sheep. Another curiosity is Gardener's first patent of 1834, which was shown by Mr. S. Colbourn, of Swindon. Again, Mr. J. Torr, M.P., showed a chaff-cutting machine, with a canvas band for helping forward the progress of the straw, which reminds one of the admirable machinery for power, shown by Messrs. Richmond and Chandler. There were many other curiosities which might be alluded to, but already my Report has, I fear, run to too great length. It will be some compensation to the Society, which incurred such trouble and expense in bringing together such a variety of interesting exhibits, which unfortunately were so little seen, if it should lead the authorities to organise a National Museum of Models.

XXX.—*Report on the Trial of Railway-Waggons intended for the Conveyance of Fresh Provisions.* By JOHN COLEMAN, of Riccall Hall, York.

THE Prizes offered by the Mansion House Committee were a Gold Medal and 50*l.* This very appropriate offer met with but two responses, viz., the waggon invented by William D'Alton Mann, of the Junior Athenæum Club, 116, Piccadilly, London, W., which was thus described in the Catalogue: "Refrigerator Car or Railway Waggon for the transport of perishable goods, meat, fish, fruit, dairy-produce, vegetables," &c.; manufactured by the Exhibitor. Price 500*l.* This car will carry 8 tons of dead meat, will preserve it in temperature below 45° for ten days in perfect condition. The process is by clear, cold, and perfectly dry air." Colonel Mann is an American, whose name is not unfamiliar in connection with railway sleeping-cars, which are largely used on Continental lines. The second entry was made by the Swansea Waggon Company of Swansea, Glamorgan, and is thus described in the Catalogue: "Railway Refrigerating Waggon, manufactured by the Exhibitors. Price 121*l.* A Railway Refrigerating Waggon for running with passenger or goods trains, fitted with Knott's patent dry air refrigerators, and specially constructed for the conveyance for long distances at a low temperature, of meat, fish, and perishable goods, without deterioration in quality or appearance." The patentee is Mr. Kennard Knott. It should be stated that, whilst the last-named waggon came hardly prepared for trial, at least very incomplete as to internal fittings, Colonel Mann's apparatus had been in actual service for some time. I have said that the prize was appropriate, and comes with noticeable fitness from the representatives of the largest consuming population in the world. The successful introduction of foreign dead meat is an accomplished fact. It can be preserved in excellent condition whilst in the vessel. But hitherto there has been a risk, and frequently a loss, especially in hot weather, during conveyance from the port to the market, and until consumed. Any simple arrangement by which meat can be kept good for a few days during transit, and for a limited period afterwards, if required, must be of great value. Nor is the importance of safe conveyance confined to foreign meat only. Year by year the advantage of slaughtering our animals as near as possible to the spot where they have been fed becomes more apparent. The drawback hitherto has been the risk of injury in travelling during warm weather, and the necessity of immediate sale on arrival, thus leaving the consignor at the mercy of the markets,

whereas live animals can be kept over without serious depreciation. With a good meat-van the grazing districts of Scotland would send all their produce in this way, both on the ground of economy and on that of the superiority of the meat. It was stated by a witness before the Contagious Diseases of Animals Committee, and never in any way disputed, that meat slaughtered in Aberdeen close to where it was fed, made one halfpenny per pound more in the London market than meat from similar beasts killed in London, owing to the loss of condition and bloom incidental to a long journey. Nor is this all; a considerable loss of weight occurs for each day that the beasts are exposed to the fatigue of travelling; and it occasionally happens that if slaughtered before they have recovered from the effects of the journey, the meat is tainted, and great losses result. The experience of the American trade proves that the cost of transport of dead meat is much less than that of the live animal; hence there is every reason why this subject should be taken up by the Society. Nor is it only as regards animal food that this experiment is important. Fruit, vegetables and dairy-produce are all perishable goods, which can be profitably transported long distances, if only the risk of ordinary carriage can be avoided. Colonel Mann told me that he was at the time of the trials in negotiation with the Russian Government as to the construction of vans to convey fruit and flowers from the South of France to St. Petersburgh.

No. 1. *Colonel Mann's Meat-Van.*—Total thickness of walls, floor, and roof, which are of similar construction, 3½ inches. Composed of jointed deals externally, next, an interval packed with sawdust, then layers of brown paper half an inch thick, on which the inventor places great reliance as a non-conductor, then similar casings of wood to the external one, and the whole lined with zinc. The roof, which is convex in form, is painted white externally, but for very hot countries a canvas covering is provided. Under the centre of the roof, inside the van, and extending nearly from end to end, is the ice-chamber, an oval vessel, with two openings for the admission of the ice. The reader will readily understand the construction of the van and its action by reference to the subjoined drawings (Figs. 1–4, pp. 762 and 763), for which I am indebted to Mr. Devonshire, of Messrs. Eastons and Anderson's staff, who was in charge of the vans from June 19th to 28th.

At the end of the waggon are two tubes, *a a*, Fig. 3 (p. 763), which have double orifices, so as to catch the wind in whichever direction the van travels. These orifices are covered with fine gauze, so as to exclude impurities as much as possible. Further,

Fig. 1.—*Longitudinal Section of Mann's Patent Waggon for Fresh Provisions.*

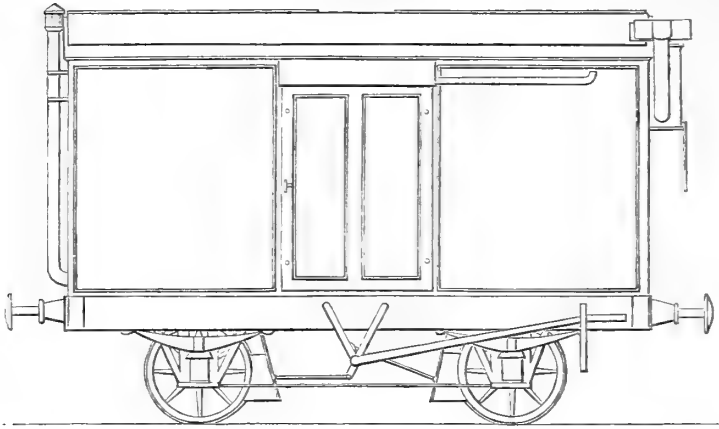
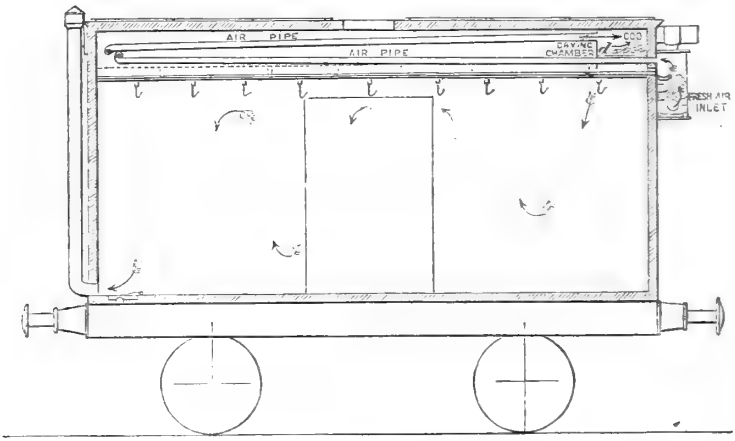


Fig. 2.—*Side elevation of Mann's Patent Waggon for Fresh Provisions.*



to insure clean air, the latter is conducted into a filter-box, *b*, external to the waggon, filled with wood shavings (willow), which are kept moist by the dropping of condensed water out of the tubes to be described. This water is collected in a trough, and from this trough it runs over on to the shavings. The air passes by copper tubes from the filter-box, right through the ice-chamber, crossing at the end and returning by tubes placed immediately above the first. These are shown at *c*, Fig. 4. It will be noticed by reference to Fig. 2, which

Fig 3.—*End elevation of Waggon showing Filter-box open.*

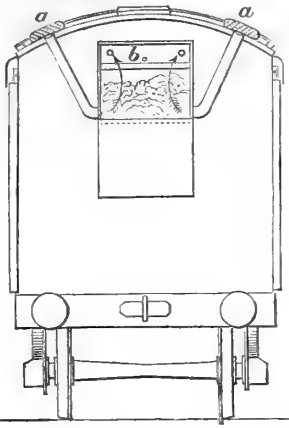
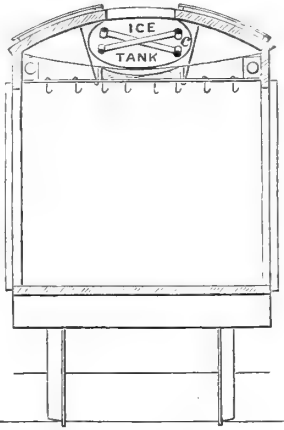


Fig. 4.—*Section through middle of Waggon.*



shows the longitudinal section, that the pipe which conveys the air from the filter-box is placed on an incline, so that the condensed moisture runs back into the trough already described. The air, on its return journey, passes into a drying chamber, shown at *d*, Fig. 2, filled with chloride of calcium. Any moisture which has escaped the condensing influence of the ice is here absorbed. The air thus dried and cooled finds its way into the meat-chamber by a number of holes in the sides of the drying chamber; being dry and cold it is heavy, and as it falls gives up some of its cold, or rather absorbs some of the heat of the meat. This causes the air to rise, and when it impinges on the sides of the ice-chamber, all moisture taken up is condensed, and escapes by channels provided for the purpose. The air again descends, and then it passes through the chamber by a series of fallings and risings until it reaches an aperture at the bottom of the opposite end, which communicates with an external tube, which leads up to the roof and terminates in a revolving cowl. The action of the air is partly illustrated by the direction of the arrows in Fig. 2. Either wind or the motion of the train causes the cowl to revolve; and even without this the higher temperature of the external tube would cause the cold air to rush out. Thus a thorough circulation of air is secured.

Across the van are nine iron beams, made of two bars placed with a space between, through which the hooks slide. The chamber is made, as far as possible, air-tight, the doors being closed upon india-rubber linings. Colonel Mann is not an advocate for a very low temperature. He considers the great point

is first to remove the animal heat as speedily as possible; therefore he would place the meat in the vans immediately after death, and if any droppings take place, the same are collected in a small well, which has an air-tight plug, so that the liquid can be easily and speedily removed.

No. 2. *Kennard Knott's Patent Meat-Van, manufactured by the Swansea Waggon Company.*—This waggon, like the other, is constructed to be air-tight, but, instead of fresh air being drawn in, the air contained in the chamber is used over and over again, being purified, dried, and cooled. The action is set up by means of a blower, which is worked from the axle of the carriage when the latter is in motion, and which can be made to revolve by manual labour if desirable. A tube communicating with the blower is fixed on one side under the top of the waggon. This tube has a number of holes. The air from the chamber is drawn by this means into a receptacle filled with charcoal, and circulates thence through a series of vertical tubes which are surrounded by ice. The temperature is thus reduced and the air dried. The mouths of the tubes open into the chamber; their upper orifices communicate with a jacket; but there is a false ceiling to the meat-chamber formed of boards, and so arranged that any moisture which condenses on the surface of the wood, finds its way into channels on each side and escapes. All these arrangements were very rough, and admit of improvement. The air, after circulation through the tubes, is discharged into the chamber at the opposite end to that from which it is sucked up. By using a mixture of ice and salt, about one-third of the latter, a greater degree of cold is produced than with ice alone. The drawings do not represent the same arrangement as regards the tubes, &c., as in the waggon which was tried. Owing to the position of the tubes, a considerable time was occupied in filling the ice-chamber, the ice having to be broken very small in order to pass between the tubes. The waggon is made of $\frac{3}{4}$-in. deal boards outside, then two inches space filled with charcoal, and $\frac{1}{8}$-in. boards inside. The interior is not lined, and there was no provision for removing or collecting drippings. The arrangements for hanging the meat were very rude. It should be noted that this waggon is mounted on carriage springs, so that it can be attached to passenger trains running at a high speed, which is not the case with Colonel Mann's waggon, which has the ordinary waggon springs.

The Judges, Messrs. Wheatley, Fowler, and Tindall, and the official reporter, met at Hanover Square, on Thursday, May 29, and decided that the Society should provide the following quantities and varieties of stores for each van; and it was

Fig. 5.—*External elevation of Knott's Patent Meat-Car.*

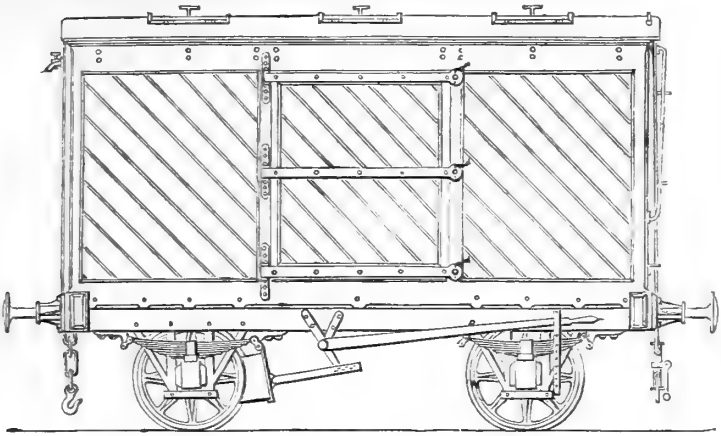


Fig. 6.—*Plan of Knott's Patent Meat-Car.*

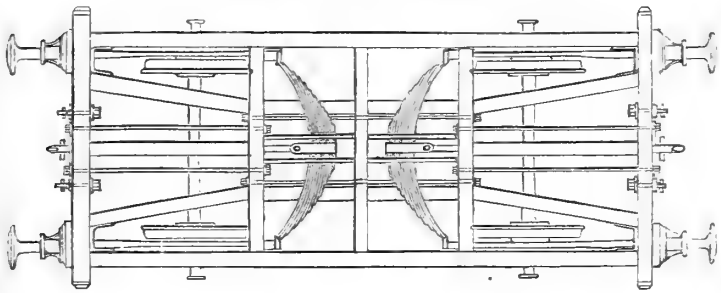
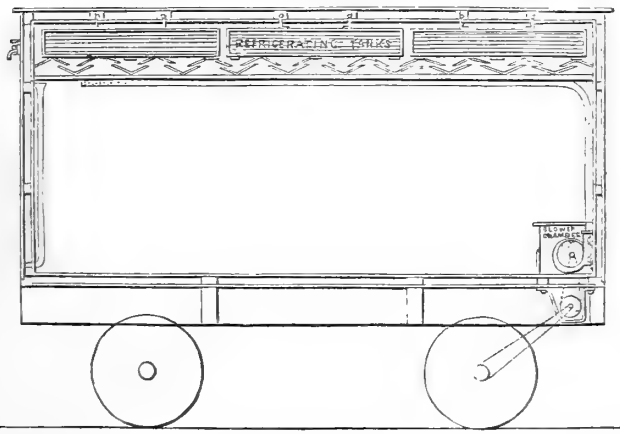


Fig. 7.—*Longitudinal Section of Knott's Patent Meat-Car.*



further arranged that Mr. Tindall should purchase the necessary animals in Smithfield market and elsewhere, in company with a veterinary surgeon, and see the same slaughtered on the day before the experiment was commenced;

Meat for each van.

One side of ox beef.
One carcass of ewe mutton (about 80 lbs.).
One carcass of wether mutton (about 80 lbs.).
One side of veal.
One porker (not exceeding 64 lbs.).
Couple of fowls.
Couple of ducks.
One gosling.
One leveret.
Couple of rabbits.

Mr. Tindall's notes as to the purchase of the above provisions are duly attached. The following regulations were issued to the competitors, and for the guidance of Messrs. Easton and Anderson's assistants (Mr. Courtney and Mr. Devonshire) who were placed in charge of the waggons.

Trial of Railway-Waggons intended for the Conveyance of Fresh Provisions.

The two railway waggons will be at Camden Station, London and North-Western Railway, by Thursday, June 19th.

The Judges will arrive about three o'clock on the above date, and see the meat packed into the waggons.

The engineers will fix a maximum and minimum thermometer into each waggon, and will arrange that an ordinary glass thermometer may be inserted into each waggon without interfering with its tightness. This should be arranged with the exhibitors in good time.

Sealing-wax, a seal and lantern, to be provided. When the waggons are loaded they are to be sealed up so as to make access to them impossible.

The waggons will leave London at 11·10 P.M. on the 19th for Holyhead, where they will arrive at 1 P.M. on the 20th. They will start on the return journey at 5·40 P.M. on the 20th, and reach London at 4·30 A.M. on the 21st.

Three engineers are to accompany the waggons. One of them must always be on duty, and never lose sight of them when they are standing in any station.

Observations of temperature inside and outside are to be taken at intervals of about one hour when the waggons are at rest, and at every available opportunity when the train is in motion.

A note-book must be kept for each waggon, in which everything that occurs must be noted, and if ice or any other material is added, notes of the time and quantity must be made.

The waggons on their return to London will be shunted into the show-yard, and kept there till Saturday, the 28th inst. The engineers must continue the watch, and make observations night and day all the time.

On the 28th the waggons will be opened by the Judges.

48, Collingwood Street, Newcastle-on-Tyne,
16th July, 1879.

John Coleman, Esq.,
Estate Office, Escrick, York,

DEAR SIR,—I have to acknowledge the receipt of your favour of yesterday's date, and, in accordance with your request, have pleasure in handing you my notes with reference to the purchase of animals to be slaughtered for the trial of "Railway Vans," entered for competition at the Royal Agricultural Society Show. They are as follows:

In accordance with a resolution passed at the Secretary's Office, 12, Hanover Square, on the 29th of May, I attended the Smithfield Cattle Market on Monday, June 18th, for the purpose of purchasing the animals necessary. I at once put myself in communication with Messrs. John Giblett and Sons, the eminent cattle salesmen of London, who were kind enough to lend me their valuable assistance. The market was a very dear one, and small lots such as I required were difficult to get; however, I at length succeeded in getting a really nice bullock, and four sheep, two gimmers, and two wethers, also of the best quality; but I could not succeed in getting either pigs or a calf such as I thought suitable in the whole market, consequently the Messrs. Giblett were kind enough to take in hand to have a calf sent in from the country for me, and a really first-class one they succeeded in procuring. I have to thank Mrs. Davis of the "Black Bull Hotel," Metropolitan Cattle Market, who supplied the two pigs, of her own breeding and feeding, and which were of the very finest quality. I could not get any lambs which I considered suitable, therefore did without them. All the lot I had sent to Mr. Bonser's slaughter-houses, where they were properly *fasted*, till the Wednesday night (June 18). At 5 o'clock P.M. on the latter date they were all professionally examined by Mr. Thomas Avis, from the Royal Veterinary College, London, who reported as to the condition in which he found them, both previous to slaughtering and after being slaughtered.

The poultry, &c., I had supplied by Messrs. Bailey and Sons, of Mount Street, London. The lot comprised two goslings, four ducklings, four fowls, four rabbits, and two leverets. They were all of the very best quality, and were sent (with the exception of the leverets) to the Camden Street Station, on the morning of June 19th, where they were killed just previous to the waggons being packed. The leverets were, I expect, killed the day before, but this I cannot vouch for. As to the packing of waggons, &c., you have all particulars, therefore it will be unnecessary for me to report further.

I am, dear sir, yours faithfully,

A. TINDALL.

On Thursday, June 19th, the Judges, Mr. Anderson and assistants, and myself, on reaching Camden Town Station about 3.30 P.M., found No. 1, Colonel Mann's waggon, charged with ice, and ready for loading, and after a thorough inspection, loading was proceeded with in the following manner:—The side of beef was divided into two quarters (London fashion). One sheep carried the kidneys, from the other they were removed and hung up separately. The porker's head was detached. The leveret and rabbits were paunched. The poultry had the feathers only removed. The side of veal was very prime, indeed, the whole of the provisions were of first-rate quality. The meat in this van was not sheeted, simply hung up, in con-

venient positions. The engineer had provided a small stage in the centre to carry the maximum and minimum thermometers, and also for supporting a wooden tube in which slided a thermometer which could be got at from the outside, and enabled the engineers to take frequent observations recorded in the interesting diagram (Fig. 8, p. 770) which accompanies Mr. Devonshire's notes. As soon as the process of packing was completed the doors were closed, locked, and sealed.

Similar provisions were placed in the Swansea waggon, but some delay occurred in completing the ice-filling process, as the size of the material had to be reduced. The inside of this van had been recently painted, and afterwards whitewashed, with a view to remove the paint smell. The meat was carefully packed in calico sheetings, being arranged in exactly the same manner as in No. 1 van, and about 6.30 the waggon was closed and sealed. The history of the waggons during their journey, 500 miles, and whilst standing at Kilburn, will be gathered from Mr. Devonshire's diary, which follows.

Two waggons were entered for these trials, one by Colonel W. D. Mann, the other by the Swansea Waggon Company, the latter being the invention of Mr. K. Knott.

The two waggons were loaded on the afternoon of Thursday, June 19th, at the Camden Goods Station, London and North-Western Railway, the engineers in charge having previously fixed in each waggon a stand to carry registering maximum and minimum thermometers, and a tube through the side through which an ordinary thermometer fixed to a long stick was inserted, for making observations of internal temperature from time to time throughout the trials. A wet and dry bulb thermometer was also placed in each waggon. The maximum and minimum thermometers were laid on wool in a box which formed part of the stand, fixed by coach-screws to the floor of the waggon. By this arrangement it was hoped that the effects of jolting would be obviated, but on examination at the conclusion of the trials, the indices of the thermometers were found to have been displaced, owing no doubt to the unusually rough treatment which they necessarily experienced when the waggons were dragged into their places at the showyard.

The stick thermometers were found to answer admirably, and may be assumed to have given indications of the internal temperatures throughout the trials. The bulbs were wrapped round with a piece of linen, which rendered them less sensitive, so that in withdrawing the thermometers the external temperature did not affect the columns of mercury before time had been given for observation.

The temperatures inside each waggon and outside in the shade were taken about every hour and a half during the trials. The results are shown in curves of temperature, a diagram of which is appended to this Report.

All the thermometers in use were lent by Mr. Casella, of Holborn, and were verified at the Kew Observatory especially for the trials.

Colonel Mann used ice in blocks, with the addition of a very small quantity of salt on one occasion during the trials; Mr. Knott employed powdered ice, mixed with salt in the proportion of about 3 of ice to 1 of salt.

Previously to the commencement of the trials, both the under-carriages were examined and passed by the inspector of the London and North-Western Railway Company.

At 11 A.M. on June 19th, Colonel Mann placed 1456 lbs. of ice in the tank in his waggon. This ice lasted until June 23, when 930 lbs. more ice were added to fill up the tank. A small quantity of salt (about 1 cwt.) was used on this last occasion, Colonel Mann wishing to reduce the temperature of his waggon below 45°, as required in the conditions of trials. As, however, the ice was in solid blocks, the salt did not take hold of it, and on next opening the tank the salt was found caked in hard lumps. On the evening of the 26th and the morning of the 27th inst., further additions of ice, amounting to 995 lbs., were made, again filling up the tank.

The total quantity of ice used in this waggon was 3381 lbs., and of salt about 100 lbs.—the quantity of ice remaining in the tank at the close of the trial being roughly estimated at 12 cwt. The average temperature from June 19th to 28th in this waggon was 49·37 deg. Fahrenheit. The variation of the external temperature was very considerable, as is shown by the diagram, the weather throughout being cloudy, with frequent rain and very little sun.

Mr. Knott on first filling his tank with ice and salt used 2016 lbs. of ice and 550 lbs. of salt; the ice was broken up into small pieces, and mixed with the salt, forming a freezing mixture of about 3 to 1. Further additions of ice and salt were made on the 21st, 23rd, 24th, and 27th instant, amounting in all to 5298 lbs. of ice, and 1492 lbs. of salt. The loading of this waggon always occupied a considerable time, as the ice had to be broken up small, and mixed with the salt, before packing it between the air-tubes which intersected the ice-tank. About two inches of brine remained in the tank at the end of the trial.

The two waggons were attached to the 11.10 P.M. express goods train from Camden to Holyhead, where they arrived at 1 o'clock on the afternoon of the 20th. For the return journey they were attached to the 5.40 P.M. passenger train from Holyhead, and arrived at Camden at 4.30 A.M. on the 21st. They were then sent on by a special engine to Salusbury Road, Kilburn, where they were shunted into the goods siding.

On the 23rd and 25th June respectively the waggons were drawn into their places in the Showyard, where they were left for the rest of the trial, in charge as before of the engineers, who had never lost sight of the waggons throughout, one always being on duty to note temperatures and any occurrences that might take place.

At 3 P.M. on the 28th inst., the Judges arrived to examine the contents of the waggons. As already stated, the registering maximum and minimum thermometers were found to have been so shaken as to be unreliable, and one of the wet and dry bulb thermometers being injured, no comparison of dryness could be made.

EASTONS AND ANDERSON.

On Saturday, June 28th, No. 1 van was opened at 3.30 P.M., and after the thermometers had been duly examined by the engineers, the Judges entered the van and proceeded to make a minute examination of its contents. A slightly unpleasant odour told that something had gone wrong, and this was soon found to be the leveret, but as this was the only animal which was not bought alive, it is possible it was not so fresh at starting as was stated. The beef had a slight coating of mould, which did not improve its appearance. The Judges' Report was as follows:—Goslings in perfect condition, sweet and firm. Rabbits wonderfully fresh. Chicken excellent. Beef dry on the outside, quite sweet and firm. In the ewe sheep in which the

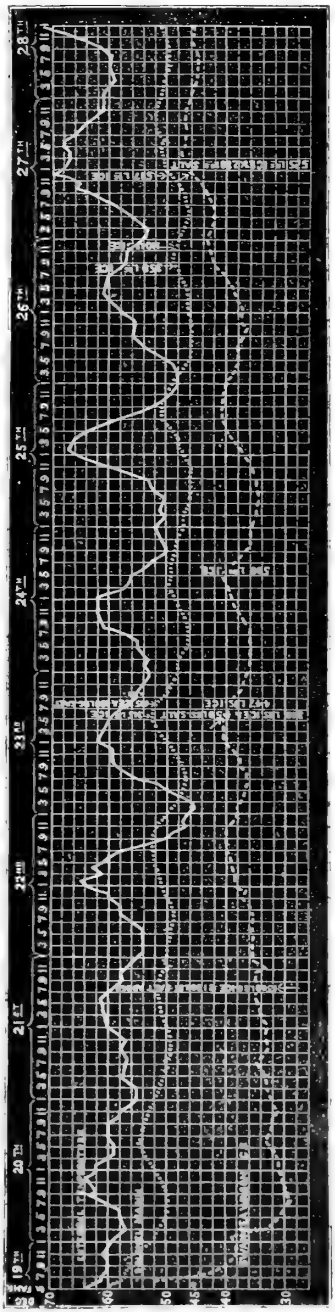


Fig. 8.—*Diagram showing the Variations of Temperature during the Trials of Railway Waggons for the conveyance of Fresh Provisions.*

kidneys were left in, the skirt between the kidneys, which should always be removed, but was left in on purpose, smelt slightly, but the kidneys were not affected. The veal was perfect, even the kidneys quite good. The wether sheep, from which the kidneys had been removed (and separately conveyed), was perfectly good. The porker was quite good. The tongue was slightly affected. The leveret was gone at the kidneys, and smelt so offensively that it was at once removed.

No. 2 van was opened at 4.10 P.M. The walls were dry, but it was evident that some of the condensed water had dripped down. The meat on being unsheeted was found more attractive to the eye. The surface equally dry, but there was no coating of mould. The provisions were decidedly in a more perfectly fresh state than No. 1 van. Thus the leveret, though suffering, was not nearly so offensive. The sheep with the kidneys left in was decidedly sweeter, and the pig's head was hardly affected at all. Indeed, the condition of the food generally was an agreeable surprise to the Judges, who had not expected such results, seeing the somewhat rude arrangements. The reason, however, is not far to seek. It will be seen by reference to Mr. Devonshire's diagram, that the mean tem-

perature in No. 2 was 39·3 as against 49·3 in No. 1, and this difference accounts for the results. The consumption of ice was, however, much greater, as will be seen by the following figures, and there was a man in attendance night and day; and when the van was stationary in the yard he occasionally worked the fan, in order to keep up the circulation of the air. The patentee, however, states that if the van had been provided with four openings at each end, two above and two below, and these had been opened according to the direction of the wind, *i.e.*, the two upper ones at one end and the two lower ones at the other, then a proper current of air would have been established without the use of the fan. The Judges had no means of testing this statement, and can only deal with the facts before them. There was the man, and there was the consumption of the ice and salt.

No. 1 Van.—*Consumption of Ice.*

	lbs.
June 19	1456
„ 23	930
„ 26	995
Total	3381
Salt	100

The ice in the chamber on Saturday, June 28th, was found to be dry and but little wasted.

No. 2 Van.—*Consumption of Ice.*

	lbs.
June 19	2016
„ 21	1500
„ 23	757
„ 24	500
„ 27	525
Total	5298
Salt	1492

The material was in a fluid condition when examined on the 28th.

The next point to which the Judges directed attention was the further keeping properties of the meat. The leverets were removed from both vans, a further supply of ice was obtained, and the vans were again sealed up until 10 o'clock on Monday morning. The following is the information received from the Judges.

No. 1 Van. June 30; 10.20 A.M. Temperature of van, 45°. —When the Judges entered the van there were unmistakable

evidences of decay. The odour was anything but agreeable, and further examination fully proved the fact that the process, however efficient it might be for a limited period, was unequal to the test required by the Society. It will be remembered that the meat was not covered up, which the Judges consider a great disadvantage to its keeping qualities, as also to its appearance; the surface of it, being more or less covered with a green mould, was very unsightly. The beef was first examined. The meat was fairly good and not unsuitable for immediate consumption; it was noticeably discoloured about the neck, and there was a considerable percentage of waste, the meat requiring to be dressed in order to be fit for the table; moreover, the flesh had lost the firm condition which was so noticeable on its first inspection, and its general character is best described by the term "flabby." The wether sheep exhibited the same mouldy appearance. The mutton, however, was fairly firm, although indications of change were visible about the neck. The veal was soft, though sweet, and had lost all its bloom. The porker when cut in two was soft and the shank end discoloured, as well as the neck, and when tested with a skewer in these parts there was a perceptible odour.

Mr. Turner, of 233, High Street, Camden Town, a practical butcher, who had cut up the sides of beef on the 19th of June, and had been present at the opening of the van on the 28th, stated his opinion that the pork was depreciated 4*d.* per lb. The head was decidedly high. The poultry appeared sweet, though somewhat soft. The rabbits were decidedly going rapidly, being much discoloured about the kidneys.

No. 2 Van; opened at 10 A.M. Temperature 43° 50″.—On entering the carriage the Judges were struck with the perfect sweetness of the air and absence of all unpleasant odour. When the cloths were removed the appearance and condition of the meat was quite as good as on Saturday as regards colour and dryness, and it was considered to be even firmer in texture. The poultry and rabbits were equally preserved. Mr. Turner gave his opinion that this meat was worth fully 3*d.* per lb. more than that in No. 1 van. The extra cost of working the Swansea waggon, the necessity of an attendant, and the additional quantity of salt, &c., are thus much more than covered by the difference in value of the meat. The Judges desire to record their thanks to Mr. Turner for the great assistance which he gave them throughout the trials.

The general survey being thus satisfactory, the next point was to cut up the meat. The first part taken off the beef was the skirt, which would naturally be the most liable to decomposition; it proved as fresh and sweet as possible, and was perfectly firm. Next the sirloin was cut out, and this

again was in admirable condition; and so on throughout the process. A portion of the chine, a handsome joint of about 16 pounds, was sent to the Society's purveyor for cooking, together with a haunch of mutton from the gimmer sheep, and these were eaten on Tuesday at luncheon. Next, as regards the pork, which, as is well known, is more difficult to keep than either beef or mutton; when cut down the back, the flesh appeared as firm and sweet as possible, even to the neck end, without an ounce of waste meat, and offering a pleasing contrast to the condition of the same article in No. 1 van. And, most important, the head, which is most difficult to keep, was also in thoroughly good condition. The sheep were next examined and proved equally good. Next came the veal, which, almost marvellous to relate, was thoroughly sound and good. A minute examination especially directed to those portions of the carcass which experience has shown are always the first to suffer, proved the fact that the process was perfectly successful, even with flesh so difficult to preserve. The poultry and rabbits were equally good. The former were sent to the purveyor for a cooking test, which I believe was quite satisfactory. The award will be gathered from the Judges' Report.

Special Prize for Waggons conveying Perishable Goods by Railway.

The Judges beg to report that the competition for this very important prize offered by the Mansion House Committee was confined to only two exhibitors, one of which was "The Swansea Waggon Company, Glamorgan, No. 11,845," and the other "William D'Alton Mann, of the Junior Athenæum Club, London, No. 11,847." The meat was slaughtered on the night of June 18th, and the poultry and rabbits on the morning of the 19th, the whole of which the Judges saw carefully placed in the respective vans on the afternoon of the 19th. After the journey of these vans to Holyhead and back, in charge of three assistant engineers of the Society, they were placed in the Showyard until they were opened on the afternoon of Saturday, the 28th. After this very severe test they found the meat, poultry, and rabbits in good condition, but in the van No. 11,847 indications of mould and decay showed themselves on the quarters of beef, and the pork and also the kidneys of the sheep were slightly affected. The vans were again closed, and left untouched until Monday morning, the 30th, and were then finally examined. There was no doubt in the minds of the Judges of the superiority, condition, and market value of the contents of the van No. 11,845. They therefore consider this van to have carried out the conditions on which the premium was to be awarded. The average temperature of van No. 11,845, both on transit and when stationary, was 39·3, that of van No. 11,847 was 49·37. On these considerations they award the premium of 50*l.* and the gold medal to the van of the Swansea Waggon Company, No. 11,845, and they recommend a Commendation be given to No. 11,847 for principles of construction and finish.

(Signed) John Kersley Fowler, Aylesbury.
A. Tindall, Newcastle-on-Tyne.
John Wheatley, Latimer, Chesham.

XXXI.—*Report of the Judges of Farm Plans sent in for competition at the London International Exhibition*, 1879. By J. Bailey Denton, Esq.

The prizes offered for plans of farm buildings were as follows:—

	£
For arable farms above 300 acres	50
For arable farms not exceeding 300 acres	50
For dairy farms above 100 acres	50
For dairy farms not exceeding 100 acres	50

It was duly notified to the competitors that the plans were to be on a scale of 8 feet to the inch, and were to be accompanied by "complete specifications" and "money bills of quantities."

There were 68 sets of plans sent in for competition from 39 different authors, of which 3 sets were disqualified.

It is due to the competitors, who took considerable pains in the preparation of their designs, that it should be stated before any observations be made upon them, that the important condition insisted upon by the Society, that each design should be accompanied by "a complete specification" and "money bills of quantities," was regarded by the Judges as tantamount to instructions that no prize should be awarded unless approved arrangement and accommodation were afforded at such a probable outlay as might fairly be charged on land in the occupation of practical farmers, and would be justified in the economy of rural estates.

As Judges acting on behalf of the highest agricultural authority in the kingdom, we considered that we should fail in our duty if we awarded a prize to a design which might present admirable features of arrangement, but which could not be executed at a reasonable cost—such a cost, we repeat, as a landowner would be justified in expending, and which the Enclosure Commissioners, who are the protectors of reversionary interests, would allow to be charged on entailed estates.

To arrive at a conclusion on this point, it became necessary that the Judges should, in the first place, prescribe for themselves a limit of expenditure, beyond which they could not convey approval, although they were thoroughly impressed with the truth that farms of the same acreage and character might require homesteads differing in accommodation, and therefore differing in cost, according to the productive capability of the land, the proportion of arable and pasture, and the customs of locality.

Having recognised such a limit, it was found that none of the plans which provided superior accommodation, with modern improvements, were so designed that they could be executed within it. Without pointing out instances in proof of this assertion, we may state that in the design which we considered exhibited the greatest merit in arrangement and detail, and which we therefore "highly commended"—we refer to the design sent in with the motto "Cheddar," by Mr. W. E. Keates, of Hanley, Staffordshire, which represented a homestead and dairy arrangement suitable for a large farm of 400 acres—the estimate of the competitor himself was 6146*l.* for homestead and dairy, *exclusive* of the dwelling-house, road approaches, and contingencies, which with architect's charges would raise the outlay to upwards of 18*l.* per acre. To repay this outlay with interest at 4½ per cent., in 31 years, would amount to 21*s.* 2*d.* per acre, while if the outlay be repaid in 25 years, the annual charge would amount to 24*s.* 1*d.* per acre.

Such a charge, the Judges considered, no farm of 400 acres, even if it consisted of the best land and commanded the best market, could bear without loss to the owner, let attendant circumstances be what they may.

Having regard to the present state of agriculture, it was certainly not difficult to come to this conclusion; at the same time, it is hardly possible to over-estimate the value of those arrangements which best secure economy in manual labour, and warmth and comfort to live stock, and it was the wish of the Judges, while withholding the prize of 50*l.*, to convey by the expression of "high commendation" their approval of Mr. Keates' design in these respects. Mr. Keates' description, with a ground-plan and isometrical view, is appended to this Report.

When considering which of the plans in each class best met the intentions of the Society, the Judges encountered insuperable difficulty in classification and comparison. This arose from the fact that, although in the conditions issued by the Society certain figures were given as a limit of the size of farms to be dealt with in each class, yet the latitude left was so great that there were hardly two competitors who aimed at the same thing. This was shown not only by the different sized farms adopted, but by the great difference of estimate where the size of the farms was the same. The difference exhibited even in the same class clearly indicated that neither in extent of accommodation nor in strength of structure were the same fundamental data recognised. This will be evident by the following illustrations, which form in the aggregate a proportion of three-eighths of the designs examined:—

CLASS I. (ARABLE FARMS above 300 ACRES).

Number in Catalogue.	Assumed Size of Farm.	Amount of Estimate.
	Acres.	£
9	900	5,158
17	700	2,098
1	600	7,924
3	500	4,675
7	450	2,878
22	400	2,064
18	300	2,780
	Total 3850	27,577

Average cost 7*l.* 4*s.* per acre.

CLASS II. (ARABLE FARMS not exceeding 300 ACRES).

	Acres.	£
31	300	5,000
38	160	1,351
34	150	558
39	95	805
	Total 705	7,714

Average cost per acre 10*l.* 19*s.*

CLASS III. (DAIRY FARMS above 100 ACRES).

	Acres.	£
45	500	3,665
54	400	6,146
51	300	5,073
48	200	1,206
46	150	4,500
55	150	1,066
53	100	2,709
	Total 1800	24,365

Average cost per acre 13*l.* 10*s.*

CLASS IV. (DAIRY FARMS not exceeding 100 ACRES).

	Acres.	£
59	100	3,750
63	100	845
61	95	735
67	50	523
	Total 345	5,853

Average cost per acre 17*l.*

The foregoing tabulated estimates do not include the dwelling-house nor sundry other items of outlay, which, as already pointed out in the case of "Cheddar," would involve an additional charge of 3*l.* or 4*l.* per acre, from which the landowner ought fairly to look for a return in some form or another. *Without these necessary additions*, the average estimated cost of the 22 designs enumerated reaches 9*l.* 16*s.* per acre; while, *with such additions*, it would not be less than 13*l.* per acre.

The great difference in the estimated cost of the designs in each class, without any correspondent difference in the size of the farms, clearly shows, as already intimated, that not only has a different amount of accommodation been aimed at—which it is possible the customs of the different localities might justify—but that the materials intended to be used, the height and thickness of walls, the scantlings of timbers, &c., were in some instances adopted in disregard of those recognised rules and regulations which are deemed essential to strength and durability, and which therefore prevail on well-managed estates in all districts alike. The Minute issued by the Enclosure Commissioners, and put in force by them when they are called upon to sanction the borrowing of money for the erection of farm buildings, will best explain what the accepted rules and regulations are. It is probable that this important public document was unknown to some of the competitors.

As a further illustration of the different provisions made where no great difference could reasonably exist, it may be pointed out that in Class I. two plans from the West of England were presented, of which one was to cost 2143*l.*, and the other nearly double, *i.e.* 4093*l.*; while from the North two designs, having the same object in view, were sent in, of which the estimated outlay was in one case 2028*l.*, and in the other 3460*l.* It can hardly be conceived that any special powers on the part of the architect could effect such a saving as is displayed by these differences, if the amount of accommodation be the same in each case, and equal attention be paid to durability and strength of structure.

Having made these observations, we have to record in a tabular form our selection of the following six designs (in addition to that of Mr. Keates) as severally displaying, in the order in which they stand, many points of excellence, both in arrangement and structure. The whole were "commended" when exhibited at Kilburn, and, having closely examined them since, the Judges are of opinion that to the authors of the first three designs (as well as to Mr. Keates) medals should be presented, and that there should be published in the Society's Journal a plan and view of each.

TABULAR STATEMENT giving the particulars of ACCOMMODATION afforded in each selected Design, with the ESTIMATE of OUTLAY.

No. of Design in Catalogue.	Class.	NAME OF AUTHOR AND MOTTO.	Accommodation for Live Stock. Horses, Colts, &c. H. Cows and Cattle of all ages. C. Swine. S.	Cubical Contents of Buildings and Covered Yards. High Buildings. H. B. Low Buildings. L. B. Open Sheds. O. S. Covered Yards. C. Y.	Superficial Space in Yards. Open Yards. O. Y. Covered Yards. C. Y.	Author's Gross estimated Cost.	OBSERVATIONS.
		HIGHLY COMMENDED.				£	
54	III.	W. A. Keates ("Cheddar") ..	H. 11 C. 170 S. 150	H. B. 78,426 L. B. 273,757 O. S. 59,725	O. Y. 18,398	6146	The Dairy Buildings are included in the Estimate of cost, but not in the cubical contents. They contain 48,770 cubic feet.
		COMMENDED.					
7	I.	Richard Waite ("Colonicus")	H. 13 C. 142 S. 20	H. B. 53,672 L. B. 42,500 C. Y. 277,200	C. Y. 10,856	2878	
20	I.	J. E. Watson ("Experientia")	H. 12 C. 118 S. 12	H. B. 96,150 L. B. 70,464 O. S. 118,272 C. Y. 72,940	O. Y. 4,352 C. Y. 12,128	3168	
12	I.	A. Dudley Clarke ("Practice with Economy")	H. 12 C. 124 S. 24	H. B. 86,422 L. B. 219,141 O. S. 15,202 C. Y. 145,008	O. Y. 6,084 C. Y. 3,000	4093	
30	II.	C. and J. Cadle ("The Eye of the Master, &c.")	H. 15 C. 75 S. 35	H. B. 26,135 L. B. 70,242 O. S. 60,228	O. Y. 6,080	1277	The cubical contents of the yards if covered would be 97,280 feet.
18	I.	W. J. and W. J. Moscrop, Jun. ("Utility," No. 2).. ..	H. 17 C. 100 S. 40	H. B. 135,700 L. B. 140,927 O. S. 49,927 C. Y. 64,125	O. Y. 3,150 C. Y. 3,150	2780	
42	II.	F. E. Walker ("Per Mare per Terram")	H. 11 C. 65 S. 25	H. B. 36,239 L. B. 75,990 O. S. 15,842 C. Y. 108,155	C. Y. 6,724	1707	

The most striking feature in the exhibition of farm plans at Kilburn, viewed as a whole, was the fact that the *covering* of stock and manure was the object most frequently aimed at—a large number of the exhibitors adopting permanent roofs for fold-yards, and, in some cases, for corn, straw, and hay stacks. Of the selected plans in Classes I. and II., intended for arable farms, those of "Colonicus" (Mr. Richard Waite, of Duffield, Derby), and of "Per Mare per Terram" (Mr. F. E. Walker, of Scole, Norfolk), represent yards wholly covered; while the plans of "Practice with Economy" (Mr. A. Dudley Clarke, of Sundorne, Shrewsbury), of "Experientia" (Mr. J. E. Watson, of Newcastle-on-Tyne), and of "Utility," No. 2 (Messrs. W. J. and W. J. Moscrop, jun., of Stockton-on-Tees), are well-considered designs, in which partial covering is proposed. The design of "The Eye of the Master is necessary to the due Economy of Labour" (Messrs. C. and J. Cadle, of Gloucester) represents open yards only, though care has been taken to indicate that these yards may be readily covered at a comparatively small cost.

There is no doubt whatever that the principle of protecting from the weather both animals and manure has gained ground considerably since the Society offered prizes for plans of farm buildings thirty years ago. The economy of warmth in feeding both growing and fatting stock, and the value of straw for fodder as well as litter, have both tended to the covering of fold-yards—a step which is likely to be more and more appreciated as our population increases and agriculture undergoes those changes which best promote the increased production of winter-fed meat. It is difficult to say which of the two characters of stock—matured beasts preparing for the butcher, or growing steers and heifers, which it is intended to turn into pastures during the summer—do best under cover during winter. Experience in a majority of cases has contradicted the assertion, that open yards with shelter-sheds are more healthy than covered yards for young animals. It is found to be hardly possible to make any animals too snug and warm if the accommodation is associated with proper ventilation, though many tenants of tillage farms, producing a large quantity of straw, prefer open fold-yards, on the simple ground that straw is more quickly consumed. It has been advanced with great truth that farmyard-manure made under a roof, owing to its dryness and want of solidity, loses a great part of the ammonia it should hold, and that its fertilising powers are thereby much reduced; but experience has proved that this dry and light condition is due rather to the wasteful use of straw as litter, where the obligation to consume it on the premises prevails, than to any

other cause. Not unfrequently there exists a deficient number of feeding stock which, with a desire on the part of the tenant to get rid of the straw he is obliged to consume rather than turn it to the most profitable account, explains the cause of the inferior condition of the manure. It is found, in fact, that if only enough straw is used as litter as will make the best manure, while keeping the stock in the yard comfortable, half the straw usually consumed as litter will suffice, and that then the manure, instead of being inferior, is of the very best description. It is needless to point out that the advantages to be gained by the use of covered yards depend very greatly upon the mode in which they are divided, and the arrangements which are made for feeding the stock they are intended to hold.

The plans of "Experience with Economy" (Mr. James Martin, Wainfleet, Lincolnshire), which show a homestead arranged in the form of a long parallelogram, with shelter-sheds dividing the yards (which are all open) one from the other, present several excellent features, although the buildings do not appear to us to be laid out on the best principles for the saving of labour; and the time is evidently approaching when the wholesale consumption of straw as litter, involved in such an arrangement as is here indicated, will be considered wasteful. It has, however, the same advantage which was claimed for Messrs. Cadle's design, that the yards can be readily covered should occasion arise. We refer particularly to Mr. Martin's design in contrast to covered yards, because we believe that this form of homestead has been adopted on the Duke of Bedford's estate at Thorney, in the county of Cambridge, and is much approved by the tenants.

A very ingenious design was sent in under the motto "A 1," which contained some very valuable features, although on the whole it was too imperfect for commendation.

In the majority of the designs presented in competition, the saving of labour in the mixing and preparation of food, its conveyance to stock in the several parts of the homestead, and the removal of the manure from the stalls, boxes, and yards, was well considered, though in only a very few instances was this important object as fully attained as it might be. In the several designs of Mr. Waite, Mr. Watson, and Mr. Clarke, there are excellent features aiming at this object; and in that of Messrs. Moscrop great practical knowledge of the subject is shown, though the high buildings appear to us to be much more costly than necessary.

It will be observed that in three of the plans tramways are intended to be laid down within the building for the carriage of food, and in one instance for the removal of manure, while in the design of Mr. Waite rails are proposed to be used for the

conveyance of corn-stacks from the yard to the threshing barn. We do not wish to convey by these remarks our unreserved approval of tramways, though there is much to be said in their favour. Where they are in use by tenants of superior intelligence and capital they are found to work well and to save money, but the time has certainly not arrived when they can be generally adopted as an improvement for which an ordinary tenant may be fairly expected to pay interest on the cost.

No further remarks on the selected plans are necessary, as the author of each will explain, by prefatory remarks and in most cases by a bill of quantities, his own design.

In conclusion the Judges beg with great deference to suggest that in the event of the Council of the Society renewing the offer of prizes:

(1.) That in every case plans of the farm-house should accompany those of the homestead;

(2.) That the acreage of arable and pasture composing the sized farm for which plans are sought should be specified, and the amount of stock of all sorts to be provided for set forth;

(3.) That a certain sum per acre should be named representing the amount of outlay which should not be exceeded;

(4.) That the plans should be in the hands of the Judges a sufficient time previous to the opening of the Show, to enable them to examine them fully.

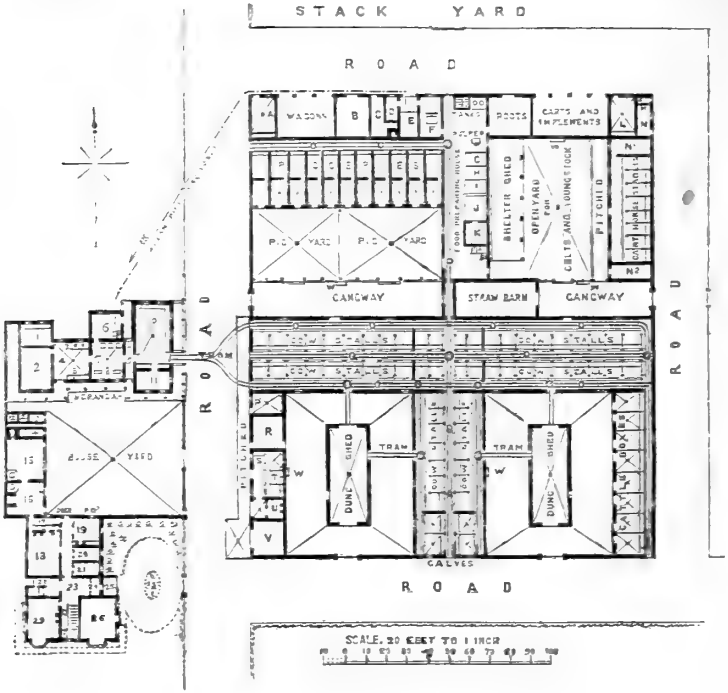
HALIFAX WYATT.
THOMAS SAMPLE.
J. BAILEY DENTON.

APPENDIX TO THE JUDGES' REPORT.

"CHEDDAR."

THE annexed general plan is for a farm homestead providing accommodation for 400 acres of land, the bulk being in pasture and worked as a dairy farm. The cow-houses are all double, and provide tying for 112 milch cows, continuous and centrally placed. The calves are located at the south end of the cow-houses. The south-east range contains eight boxes, which are convertible into stalls; and on the south-west, and immediately opposite the house, are the nag-stables, harness-room, and chaise-house, together with large box for calving, or for a brood mare. These buildings form the sides of two open yards, proposed to be kept clean and pitched with stone; in the centre of each is a spacious dung-shed, with liquid manure-tank conveniently placed for the reception and preservation of the manure made. These yards are open to the south and enclosed with a dwarf wall. The straw-barn and food-preparing room are annexed to the cow-houses and

Fig. 1.—*Dairy Farm Homestead,* 400 *Acres.*—"*Cheddar.*"



References to Farm Homestead.

A. Hospital.
B. Artificial manure stores.
C. Poultry.
D. Coals.
E. Boiler.
F. Engine-room.
G. Meal.
H. Meal.
I. Cake.
J. Mixing.
K. Chaff-box.
L. Bull.
M. Privy.
N. Tools. N 1. Harness. N 2. Hay and chaff.
O. Feeding passage.
P. Loose-box.
Q. Feeding passage.
R. Hay and straw.
S. Bin.
T. Nag stable.
U. Harness.
V. Gig-house.
W. Trough.

References to Dwelling House.

1. Butter-room.
2. Cheese-room.
3. Steamer.
4. Washing.
5. Slop-stone.
6. Engine-room.
7. Churning.
8. Churn.
9. Passage.
10. Milk-room.
11. Store for clean utensils.
12. Privy.
13. Dust.
14. Coals.
15. Wash-house.
16. Scullery.
17. Larder.
18. Kitchen.
19. Business-room.
20. Pantry.
21. Stores.
22. Passage.
23. Hall.
24. Vestibule.
25. Porch.
26. Living-room.
27. Stairs.
28. Hats and coats.
29. Parlour.

extend north towards the stack-yard, with a gangway through on the south. The floor over this range contains granary, mill-room, and chaff-room. The mixing or preparing room is fitted with the cake and meal bins, chaff steaming-chamber, steamers and tanks for mixed food and milk. The north range consists of waggon, cart, and implement sheds, artificial-manure store, infirmary, engine-room, boiler-shed, and chimney-stack. The poultry-house adjoins the boiler and stack, and is provided with circulating flues for warmth. Root-house, bull-box, and tool-house. Adjoining the mixing-house, with a southerly aspect, are the pig-dens and courts for 150 pigs, all roofed in, with two open yards adjoining. The cart-stables are placed on the north-east, and enclose a yard for colts or young stock, provided with a shelter-shed.

On the west side, and opposite the cow-houses, is the dairy or factory for the conversion of the milk into cheese and butter, and comprises a milk-room, store for clean utensils, churning-room, engine-room, wash-house, cheese and butter-making room. To equalise the temperature the walls are built "hollow," with double roofs covered with felt and tiled. A 6-foot verandah is carried round three sides, and the windows are provided with outside Venetian shutters. The walls internally are lined with Marsden's patent glazed interlocking tiles.

Throughout the premises particular attention is paid to the ventilation and drainage. All the feeding-passages are fitted with a tramway, likewise the cow-houses, for the removal of the manure and milk. The buildings throughout to be supplied with water from a well and pumped into a 3000-gallon cistern for distribution. A 10-horse power engine for the farm premises, and a 3-horse power engine for the dairy fed from a Cornish boiler, will work all the machinery and pump water. The roofs are spouted and drained into a tank near the boiler. The dairy premises to be heated by hot-water pipes in the winter, and means are provided for raising the temperature of the water supplied to the cows.

"Colonicus."

Description by the Author.

In this design all the buildings except the waggon-shed and artificial-manure stores are grouped together in a parallelogram, 184 feet by 121 feet, the total cubic space, including walls and roof, being 380,390 feet, of which rather more than three-fourths are devoted to accommodation of live stock, and the remainder to the necessary offices. Full particulars of the provision made for the various classes of stock are given in the accompanying schedule. The design also includes an arrangement for drawing in entire stacks on wheels, and thrashing under cover.

The buildings face due south, with the waggon and implement-sheds, mixing-room, straw-barn, and stackyard, on the north side.

It has been the endeavour of the architect, who also occupies a small experimental farm and is a successful exhibitor of stock, to so arrange the premises as to reduce the labour of attending cattle as much as possible, to provide easy means of communication, and to construct the buildings in a plain and substantial manner, avoiding everything tending to render necessary large periodical outlays for painting and repairs.

Stables.—The stables are in all cases 18 feet from back to front, and the stalls 6 feet wide; thus allowing ample space for hanging up gearing behind each horse. There is direct communication with the covered yards for disposal of manure, and also with the mixing-room and stack-yards, by means of

Fig. 2.—*View of Buildings for Farm of* 450 *acres.*—"*Colonicus.*"

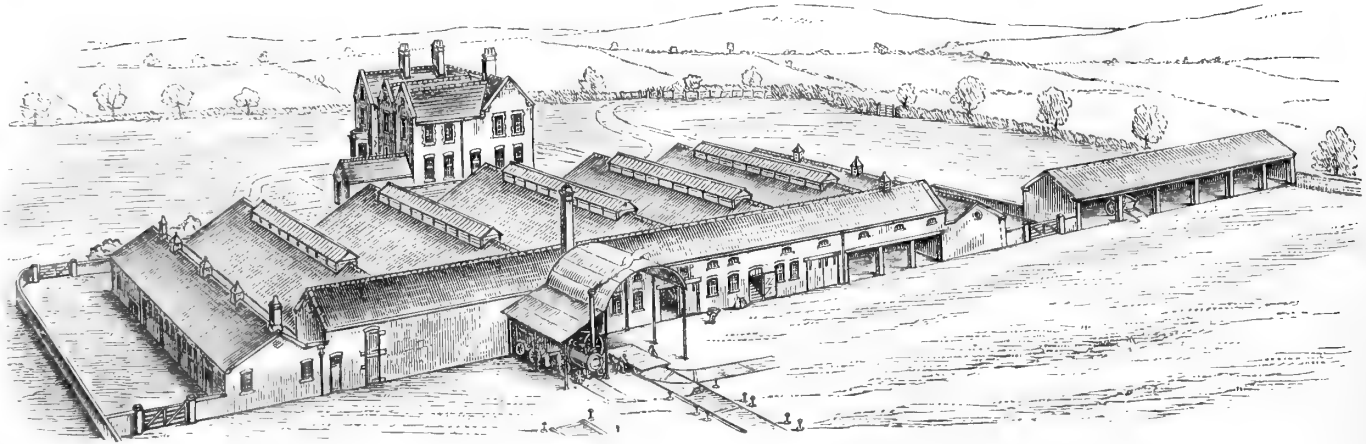
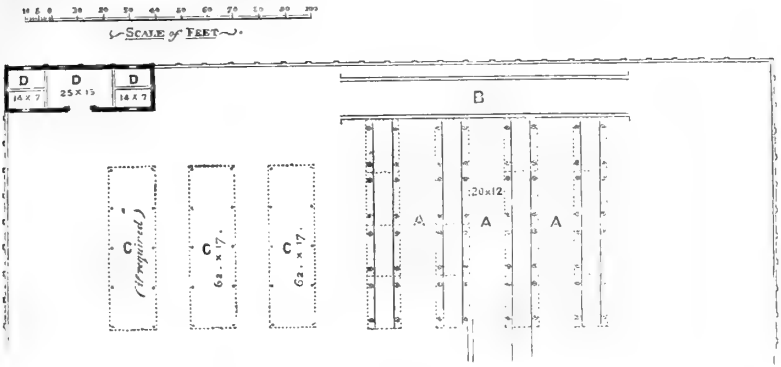


Fig. 3.—*Plan of Stackyard.*



AAA. No. 20 Corn stacks, 20 × 12 ft. on frames over tramrails for conveyance to the threshing barn.

B. Traverse way for corn-stacks.
CCC. Hay and straw-barn.
D. Artificial-manure store.

Fig. 4.—*Plan of Floor over Implements.*

E. Granary. E'. Pulley. F. Chop-floor. F'. Steamer. G. Upper part of straw-barn.

tramrails and gangway. The carthorse-stable is divided by a store for fodder and spare harness.

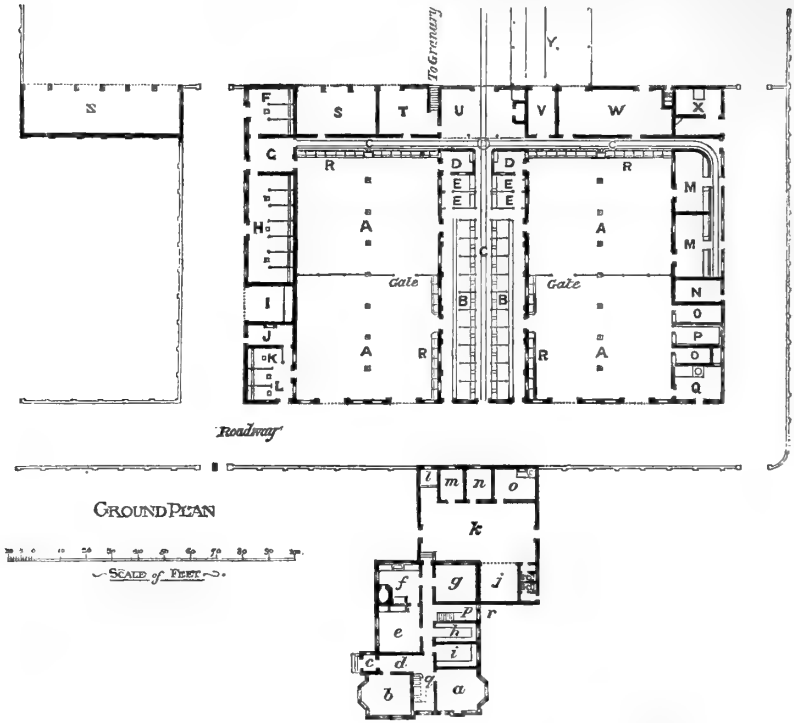
The nag-stable with harness-room and coachhouse are placed at the south-west corner, to be conveniently near the dwelling-house.

Cattle-stalls.—Tie-up stalls are shown for forty beasts, available for either dairy or fattening purposes, in a double row, separated by a central gangway 6 feet wide, in which a tramway, 20-inch gauge, is laid. The standing room for each pair is 7 feet in width; the feeding-troughs are of blue, or other suitable bricks, and there is a cast-iron water-trough, with hinged lid to each pair of beasts, all opened and shut by wheel and pinion-motion. The beasts are fed through transverse rails next the gangway, instead of the old system of building a dwarf brick wall, which prevented a free circulation of air in front of the cattle when lying down.

Fattening-boxes.—Four fattening-boxes are shown adjoining the tie-up stalls, and under the same roof; the number may be increased by reducing the number of stalls. It will be observed that the area of floor-space in each box is the same as for a pair of beasts tied up, but considerably less per head than in the covered yards. An enclosed box for a bull and also a hospital are also shown, with access to gangways and covered yards.

Covered Yards.—Two large covered yards, 95 feet by 55 feet, shown subdivided on the plan, will accommodate 80 beasts, if those of various ages are kept distinct, the area of floor-space provided for each being on the average 135 feet 7 inches. Feeding-troughs and self-filling water-troughs are shown so situated as to be available for each portion if the yards are subdivided.

Fig. 5.—*Plan of Farm Buildings*—"*Colonicus.*"



A A A A.	Covered yard.	J.	Harness.	S.	Implements.
B B.	Stalls for beasts.	K.	Loose-box.	T.	Roots.
C C C.	Tramway.	L.	Nag-stable.	U.	Mixing.
D D.	Bull-box and hospital.	M M.	Calves.	V.	Engine.
E E.	Feeding-pens.	N.	Fowls.	W.	Straw-barn.
F.	Stable.	O O.	Pigs.	X.	Shoeing-forge.
G.	Harness and passage.	P.	Breeding-sty.	Y.	Threshing-barn.
H.	Carthorse-stable.	Q.	Boiling-house.	Z.	Waggon-shed.
I.	Coach house.	R R R R.	Boozing water.		

a. Drawing-room.	*f.* Scullery.	*k.* Yard.	*o.* Wash-house.
b. Dining-room.	*g.* Dairy.	*l.* Ashes.	*p.* Back staircase.
c. Porch.	*h.* Store.	*m.* Fuel.	*q.* Staircase.
d. Hall.	*i.* Pantry.	*n.* Boots.	*r.* Garden entrance.
e. Kitchen.	*j.* Shed.		

The yards are well lighted and ventilated by ridge skylights and louvres; also by large arched openings on the south front, 10 feet wide and 12 feet high, to admit loads of hay and corn for temporary shelter in harvest time.

If desired, these yards may be left uncovered at a great saving of expense, providing only lean-to sheds for shelter against the high building on the north side; they could be roofed in at any future time without difficulty. The walls are carried up to the roof-line to prevent infection, should disease appear; the floors are excavated with a graduated fall of 2 feet 6 inches from the south front, so as to hold as great a depth of manure as possible.

Calf-pens.—Two calf-pens are provided, fed from a gangway in connection with the mixing-room, and with access both to covered yard and the external road.

Piggery.—Three large pig-styes (one being specially prepared for breeding purposes) are shown, all under cover, with boiling-house and swill-cistern adjoining. The author has had practical experience of the difficulty of breeding and feeding pigs for sale at a profit in competition with American importations, and has provided but little more accommodation in the piggery than is needed to supply the house with bacon, &c.

Fowl-house.—The fowl-house, situate between the calf-pen and piggery, is convenient for access from the dwelling-house.

Offices.—It will be seen that the mixing-room and root-store, with "chop" or cutting-room over, are in the centre of the block on the north side adjoining the stackyard; tramrails communicate with all parts of the buildings and stackyard. In the mixing-room is a brick-built steaming-closet (supplied with steam direct from the engine hereinunder described), also a grist-mill.

The root-house being intended to hold only a few days' supply, space is provided to stack the bulk of the roots in clamps in the stackyard to be brought in on tram-waggons as required. It is found in practice that this is not a waste of time or labour, as the tram-waggons run close to the pulper, and roots keep much longer in clamps than when stacked in a building in large quantities.

Straw-barn.—The straw-barn is carried up to the full height of two floors, and contains 516 cubic yards of space for storage. It is provided with doors to the stackyard and granary, and communicates with the cutting-room above the mixing-room.

Steam-engine.—Motive power is supplied by a portable or a traction engine resting on grooves in the floor, by which it is always secured in the same position, and is connected with shafting running the whole length of the chopping-room above; it also supplies the steaming-closet, and is available for threshing, steam-ploughing, &c., as may be required. The connection between the engine-funnel and brick chimney-shaft is made by means of a telescope-slide resting on the base of the funnel, worked by a lever. This has been carried out in practice by the author, and works very satisfactorily.

A blacksmith's forge, shoeing-place, earth-closet for the use of men, and stores for artificial manures, are shown.

The waggon and implement-sheds adjoin the carthorse-stable on either side, facing due north. A granary is constructed on the implement-shed, with suitable provision for raising and lowering corn from or to waggons underneath.

Threshing under cover.—The plan under consideration was the only one exhibited which provided means for drawing entire stacks to a barn under cover, so as to be available in all weathers. The stacks are built on wood-frames over tramrails, 7 feet 6 inches gauge, resting either on wheels (old railway-waggon wheels answer every purpose) or on the ordinary supports to stack frames. In the latter case the frame is lifted by jacks, and wheels are inserted under each end. The stacks (except the four centre ones) are then drawn by horses on a trolly running on rails along the traverse-way, which is sunk 2 feet 6 inches below the surface, and thence to the threshing-barn. The threshing-drum is placed as shown under a Dutch barn, and straw delivered direct into the straw-barn. Seven men only are required to perform all operations, including stacking the straw, cleaning, and weighing the corn in sacks ready for market.

Two galvanized hay-barns, 62 feet by 17 feet, on wrought-iron standards, are included in the estimate.

All drainage from the live stock is conducted to a liquid-manure tank: rain-water also to tanks as required.

The fences round the buildings may be either quickset-hedge, or brick walls; they are not included in the estimate.

It has been the endeavour of the architect to design a good homestead, with accommodation for 150 head of horned stock, and 13 horses. In determining the number of acres for which it is suitable, much must depend on the system of farming pursued.

RICHARD WAITE, *Architect*,
Duffield, Derby.

Sept. 5, 1879.

BILL OF QUANTITIES AND DETAILED ESTIMATE.

Yards.	Feet.	Inches.	No.		£	s.	d.
				EXCAVATOR AND BRICKLAYER.			
794	cube	..	..	Excavate soil in trenches and tank, and deposit on site, at 6*d*.	19	17	0
				Allow the sum of 70*l*. for drainage, and include No. 27 panteipits and gratings	70	0	0
2738	sup.	..	..	9 in. reduced common brickwork in mortar, all external and internal surfaces neatly pointed, at 4*s*. 6*d*.	616	1	0
15½	sup.	..	..	4½ in. arch and centre, with manhole to tank, at 4*s*...	3	2	0
			4	9 in. elliptic arches to 10 ft. openings, at 10*s*.	2	0	0
			8	Semi-circular arches to 6 ft. openings, at 7*s*.	2	16	0
			65	Segmental arches to 3 ft. 6 in. openings, at 2*s*.	6	10	0
			6	Segmental arches to 4 ft. 6 in. openings, at 3*s*.	0	18	0
			32	Segmental arches to 3 ft. openings, at 2*s*.	3	4	0
			3	Segmental arches to 2 ft. 6 in. openings, at 2*s*.	0	6	0
			7	Circular arches to 2 ft. 3 in. diameter, at 4*s*.	1	8	0
103½	lin.	..	..	Ex. only cut to rake of gables, at 8*d*.	3	9	0
235	..	..	..	Ex. only 3 plain-sailing cornices, at 6*d*.	5	17	6
55½	..	..	..	Cement render to tank and swill cistern, at 1*s*. 6*d*.	4	3	3
923½	..	..	..	Selected hard-paring bricks in mortar on dry foundations, at 2*s*. 6*d*. ..	115	8	9
152½	..	..	..	Common brick flat ditto, at 1*s*. 9*d*...	13	6	10
1102½	..	..	..	8 in. concrete floor to covered yards, at 1*s*. 4*d*...	73	10	0
73	lin.	..	..	9 in. by 4½ bevelled blue-brick sills, jointed in cement to door openings, at 2*s*.	7	6	0
37	..	..	..	Throated blue-brick window sills, at 2*s*.	3	14	0
96	..	..	..	Blue-brick coping, one edge in cement, at 1*s*. 9*d*.	8	8	0
				Brickwork and fixing only to copper	0	12	0
			4	Ex. only labour to chy. caps, at 3*s*.	0	12	0
				Carried forward .. .. £	962	9	4

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Brought forward	962	9	4
			13	Stable mangers in blue bricks, 6 ft. long, 1 ft. 10 in. wide, at 1*l.* 7*s.* 6*d.* With ½ brick arch under, the bricks to be purpose made and jointed in cement.	17	17	6
			40	Cow boozing-troughs, 3 ft. 4 in. by 2 ft. 3 in., of similar bricks, but no arches under, with divisions for water troughs, at 15*s.*	30	0	0
			6	Boozings to bull and hospital boxes and feeding pens, at 1*l.* 3*s.*	6	18	0
	233	lin.	..	Boozings to calf-houses and covered yards, with divisions, at 5*s.*	58	5	0
				Bed all window and door-frames in cement.			
				Carried to Summary .. £	1075	9	10
				MASON.			
	15	1	cube	Tooled stone templets, at 3*s.* 6*d.* ..	2	12	9
	7	7	..	Tooled stone lintels and heads, at 3*s.* 6*d.*	1	8	6
	5	0	..	Tooled stone outlets to gutters, at 3*s.* 6*d.*	0	17	6
	15	1	..	Tooled stone coping to gutters, at 3*s.* 6*d.*	2	13	0
	153	4	..	Tooled stone hook and catch stones and labour only, let-in hooks and catches, at 3*s.* 6*d.*	26	16	8
	31	3	..	Tooled stone steps to granary, at 3*s.* 6*d.*	5	9	4
	36	..	..	Tooled stone bases to columns, at 3*s.* 6*d.*	6	6	0
	1	3	..	Tooled stone stops to gates, at 3*s.* 6*d.*	0	4	4
	2	6	cube	Tooled stone curb to manhole of tank, at 3*s.* 6*d.*	0	8	9
	6	3	sup.	3 in. fork cover to tank, at 1*s.* 3*d.* ..	0	7	9
	10	6	..	3 in. fork hearth to harness-r., at 1*s.* 3*d.*	0	13	1
				Carried to Summary	£47	17	8
Squares.				CARPENTER AND JOINER.			
	206	8	cube	Floor joists, at 2*s.* 2*d.*	22	7	9
15	93	sup.	..	1¼-in. matched floor-boards, with three trap-doors trimmed for and framed in same, at 1*l.*	15	18	7
	763	7	cube	Red deal framed in roof trusses, with all necessary wrt. iron-work, at 2*s.* 2*d.*	82	14	5
	119	10	..	Wall plates and bond, at 2*s.* 2*d.* ..	12	19	7
	12	9	..	Valleys, at 2*s.* 2*d.*	1	7	7
				Carried forward .. .. £	135	7	11

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Brought forward	135	7	11
	425	2	..	Purlines, at 2*s.* 2*d.*	46	1	2
	43	2	..	Ridge, at 2*s.* 2*d.*	4	13	6
	1007	..	..	Spars, at 2*s.* 2*d.*	109	1	10
	138	..	..	Bearers and stretchers to skylights and gutter beams, at 2*s.* 2*d.* ..	14	19	0
	132	cube	..	Wrt. framing to skylights, at 2*s.* 10*d.*	18	14	0
	55	8	..	Wrt. lintels, at 2*s.* 8*d.*	7	8	5
	2238	sup.	..	3 by 2 skylight bars, wrt., and rebated, at 8*d.*	74	12	0
	1899	lin.	..	7 by 1 wrt. and fixed louvres, at 3*d.*	23	15	0
			1	Jacob's ladder, 9 ft. long, 2 ft. wide, fixed against wall	0	12	0
			7	Ventilators framed on ridge over stables and granary, at 1*l.* 10*s.* ..	10	10	0
	195	sup.	..	Solid deal frames, oak sunk and weathered sills, half filled with fixed glass bars, the remaining half with movable louvres, at 1*s.* 4*d.*	13	0	0
	43	9	..	7 by 1 fixed louvres in solid circular frames, 2 ft. diameter, measured square, at 1*s.* 8*d.*	3	12	10
	85	lin.	..	4½ by 3 wrt., reb. and chambered door-frames, cambered heads, at 4½*d.*	1	11	10
	455	sup.	..	2½ framed and ledged doors for apparatus to slide, average width 8 feet, at 1*s.* 6*d.*	34	2	6
	87	9	..	2 in. framed and ledged doors for apparatus to slide, 3 ft. 3 in. wide, at 1*s.* 4*d.*	5	17	0
	614	9	..	1¼ ledged and braced, matched and beaded doors, part in two heights, at 10*d.*	25	12	3
	401	..	..	1 in. ledged and braced, matched and beaded doors, part in two heights, at 8*d.*	13	7	4
	157	..	..	2½ framed and ledged gate entrance to covered yards, the upper part filled in with ⅝ in. iron rods 5 in. apart, wood capping on top rail, at 2*s.*	15	14	0
	216	lin.	..	3 by 2 grooved sliding rail, at 3*d.* ..	2	14	0
			1	Oak gate to stackyard	1	7	6
			1	Pair 36 bands and hooks, at 6*s.* 6*d.*	0	6	6
			8	„ 30 „ at 5*s.* 6*d.*	2	4	0
			20	„ 24 „ at 5*s.* ..	5	0	0
			5	„ 18 „ at 4*s.* ..	1	0	0
			14	„ 15 „ at 3*s.* 9*d.*	2	12	6
			20	„ 12 in. „ at 3*s.* 6*d.*	3	10	0
			28	Latches and catches, at 2*s.*	2	16	0
			4	Sets of wheels and runners to sliding doors, 8 ft. opening, at 2*l.*	8	0	0
			2	Sets of wheels and runners to sliding doors, 7 ft. opening, at 2*l.*	4	0	0
				Carried forward	592	3	1

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Brought forward	592	3	1
			4	Sets of wheels and runners to sliding doors, 3 ft. 2. in. opening, at 1*l.* 15*s.*	7	0	0
			1	Set of wheels and runners to sliding doors, 6 ft. opening, at 1*l.* 17*s.* ..	1	17	0
			28	9 in. stock locks, at 3*s.*	4	4	0
	13	6	lin.	¾ wrt. rod for hanging doors, at 1*s.*..	0	13	6
			8	Fastenings to piggery doors, at 2*s.*..	0	16	0
			5	Bolts to piggery doors, at 6*d.*	0	2	6
			14	Turnbuckles and padlocks, at 2*s.* 6*d.*	1	15	0
			4	12 in. barrel bolts, at 2*s.*	0	8	0
			4	Catch plates, at 2*s.*	0	8	0
			25	Oak bolts, at 1*s.*	1	5	0
	798	sup.	..	2 in. tongued elm stall divisions, at 1*s.* 6*d.*	59	17	0
			9	Cast-iron work only, for 2-in. tongued elm stall divisions, heel post, top and bottom rail, at 1*l.* 15*s.*	15	15	0
				Ex. only to three doors in loose box and stall division, forming passage in carthorse-stable, at 12*s.*	1	16	0
	54	lin.	..	⅝ in. wrt. vertical railing, 4½ centres, 18 in. high, and fixing, at 1*s.* 6*d.*	4	1	0
	672	..	..	1 in wrt. one side elm boarding to divisions to cow stalls, 6 ft. by 4½ in. by 3 in. head, 5 ft. by 4½ in. by 4 in. heel posts, rails, 6 ft. 1 in. by 4½ in. by 1½ in. at top, 4½ in. by 1½ in. middle and bottom rails, at 1*s.* 3*d.*..	42	0	0
	54	lin.	..	Cast-iron rail and sill to loose box and passage divisions in stable ..	2	10	0
			5	Heel posts, at 5*s.*	1	5	0
			44	2½ ash boozing stakes, with two ⅝ in. screw pins to each, at 2*s.*	4	8	0
	494	sup.	..	1 in. straight joint boarded divisions to corn bays in granary, and post, at 1*s.*	24	14	0
	320	lin.	..	3 by 2 rails in front of cows and calves, at 3*d.*	4	0	0
				Allow the sum of £ for fittings to nag-stable and harness-room ..	7	10	0
				Allow the sum of £ for fittings to carthorse-stable and carthorse harness-room	10	0	0
				Note.—The two sums above do not include stall divisions, but hay-racks and harness-pegs.			
				Allow the sum of £3 10*s.* P. C. for pulley wheel, and fix same	4	0	0
15	69	sup.	..	¾ in. valley boarding, at 2½*d.* per ft.	16	6	10
			1	Moule's Patent Earth closet with seat, riser, and cistern complete ..	3	10	0
				Fittings to fowl-house	1	10	0
				Carried to Summary ..	£813	14	10

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				IRON-FOUNDER.			
171	lin.	..	..	4 in. cast-iron eaves, spout, and stays, painted three coats, at 1*s.* 6*d.*	12	16	6
			20	Stop ends and outlets, at 1*s.*	1	0	0
29½	lin.	..	..	3 in. circular cast-iron rain-water conductors, at 1*s.* 6*d.*	2	4	3
			5	Swan necks, at 2*s.*	0	10	0
42	..	..	..	4 in. cast-iron rain-water conductors, at 1*s.* 8*d.*	3	10	0
			20	Cistern heads, at 2*s.* 6*d.*	2	10	0
171	lin.	..	..	Macfarlane's cast-iron centre gutter, at 3*s.*	25	13	0
			6	Stop ends, at 2*s.*	0	12	0
			12	Outlets, at 2*s.*	1	4	0
			19	4 ft. 6 in. by 3 ft. cast-iron casements, each to open, at 13*s.* 6*d.* ..	12	16	6
			10	3 ft. by 2 ft. cast-iron casements, without openings, at 6*s.*	3	0	0
			14	Cast-iron columns, 10 ft. long, average diameter 6 in., 1⅛ in. metal and flanged caps, at 2*l.* 5*s.*	31	10	0
			2	Cast-iron columns, 6 ft. long, at 1*l.* 10*s.*	3	0	0
			2	Cast-iron columns, 9 ft. long, average diameter 4 in., at 1*l.* 18*s.*	3	16	0
			2	Hay barns with 10 rolled iron, 4 by 4, standards to each + 17 ft. long, bedded on stones, covered with a semicircular roof of corrugated iron, with ⅝ in. tie-rods, complete. Area of each 60 ft. by 16 ft. ..	80	0	0
			2	Cast-iron water troughs, 3 ft. by 2 ft.			
			12	Hit-and-miss cast-iron air ventilating grates, at 2*s.*	1	4	0
			1	Copper	0	12	0
			1	Threshing barn with 6 rolled iron standards, 18 ft. long and 3 ft. 8 in, 11 ft. long, bedded on stones, covered with semicircular roof of corrugated iron with ⅝ in. tie rods, and a portion with lean-to roof of the same material. The area of the whole 31 ft. square			
				Allow the sum of 2*l.* P. C. for vanes, and fix same	2	0	0
	42	lin.	..	1 in. wrt. rail and stays to protect young pigs, at 6*d.*	1	1	0
	106	..	..	Decanville's tramway, at 20 in. gauge, at 3*s.* 9*d.*	19	17	6
	5	..	..	Ex. only curved on Plan, at 1*s.* 6*d.*	0	7	6
			1	5 ft. turntable	5	0	0
			1	Stove to harness room, pipe, plate, and door to steamer	3	0	0
				Carried to Summary	£217	5	3

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				PLUMBER AND GLAZIER.			
Cwt.	qrs.						
19	2	..	..	Milled lead in valleys and flashings, at 1*l.* 4*s.*	23	8	0
	Feet.	Inches.					
	333	6	..	21 oz. seconds sheet glazing, puttied, at 7*d.*	9	14	7
	2003	6	..	¼ in. rough plate glazing, sprigged in to skylights, at 7*d.*	58	8	9
			8	Glass tiles, at 2*s.* 6*d.*	1	0	0
				Carried to Summary	£92	11	4
				TILER.			
Squares.	Feet.						
256	15	sup.	..	Roof tiling with Poole's patent corrugated roofing tiles, 85 of which cover a square, include ¼ × ¾ deal sawn laths, at 1*l.* 3*s.*	284	11	0
Yards.	104	6	lin.	Cutting to valleys, at 6*d.*..	2	12	3
240	..	..	..	Ridge tiles, P.C., 4*d.* per foot, bedded in mortar, at 1*s.* 3*d.*	15	0	0
123	..	..	..	Cement fillet, at 3*d.*	1	10	3
				Carried to Summary	£303	13	6
				PLASTERER.			
201	sup.	..	..	L. P. and set to ceilings, at 1*s.* 4*d.*..	13	8	0
74½	..	..	..	Lime-white, two coats to walls, at 2*d.*	0	12	5
				Carried to Summary	£14	0	5
				PAINTER.			
957	..	..	..	Prime stop knob, and afterwards paint 2 coats, plain oil-colours on wrt. woodwork, at 8*d.*	31	18	0
				Note.—The painting on iron windows, spouting, &c., is included in Iron-founder.			
				Japan all ironmongery black.			
				Carried to Summary	£31	18	0
				ARTIFICIAL MANURE STORE.			
14	cube	..	..	Excavating to trenches, at 6*d.* ..	0	7	0
185	sup.	..	..	9 in. reduced brickwork, at 4*s.* 6*d.*..	41	12	6
90	sup.	..	..	Common brick flat paving, at 1*s.* 9*d.*	7	17	6
	9	lin.	..	Blue-brick door-sill, at 8*d.*	0	6	0
	12	..	..	Blue-brick window-sill throated, at 8*d.*	0	8	0
	42	..	..	Cut to rake of galles, at 3*d.*	0	10	6
	158	..	..	2 course plain-sailing to eaves, at 2*d.*	1	6	4
	1	7	cube	Stone templet, at 3*s.* 6*d.*	0	5	6
	24	..	..	Red deal in roof trusses, at 2*s.* 2*d.*..	2	12	0
				Carried forward	55	5	4

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Brought forward	55	5	4
	71	7	..	Purlins, ridge, wall plates and spars, at 2*s.* 2*d.*..	7	15	2
	4	..	..	Wrt. lintel, at 2*s.* 8*d.*	0	10	8
			1	Set wheels and runners to sliding door, 8 feet opening, at 2*l.*	2	0	0
			1	Turnbuckle and padlock, at 2*s.* 6*d.*..	0	2	6
	54	sup.	..	2½ in. framed and ledged door, with sliding apparatus (fixing only), at 1*s.* 6*d.*	4	1	0
Squares.							
11	48	..	..	Poole's patent corrugated roofing tiles, on laths, at 1*l.* 3*s.*	13	4	1
	56	..	lin.	Ridge tile in mortar, at 6*d.*	0	8	0
	41	..	..	Cement fillet, at 1*d.*	0	3	5
37½	..	..	..	4 in. ½-round eaves spouting and stays, painted 3 coats, at 1*s.* 6*d.* ..	2	16	0
5	..	..	..	3 in. R. on conductors, No. 2 swan necks, at 1*s.* 6*d.*	0	7	6
		24	sup.	Cast-iron casements and painting 3 coats, at 1*s.*	1	4	0
		22½	..	21 oz. sheet glazing, puttied, at 7*d.*..	0	13	1
	14½	..	..	Prime knob stop and paint 3 coats, at 8*d.*	0	9	8
				Carried to Summary	£90	0	5
				SUMMARY.			
				Excavator and Bricklayer	1075	9	10
				Mason	47	17	8
				Carpenter and Joiner	813	14	10
				Painter and Glazier	92	11	4
				Ironfounder	217	5	3
				Tiler	303	10	6
				Plasterer	14	0	5
				Painter	31	18	0
				Artificial Manure Store	90	0	5
				Leave all clean and complete.			
				Amount of Estimate .. £	2686	7	10
				Add	191	17	6
				Total .. .. .. £	2878	5	4

Supplementary Estimate of Stack-Frames, Tram-Rails, Traverse-Way, Threshing-Barns, and Hay-Barns, as shown on Plan No. 16.

Yards.	Feet.	Inches.	No.		£	*s.*	*d.*
180	cube	..	..	Excavate soil in traverse way, at 6*d.*	4	10	0
77	sup.		..	9 in. reduced brickwork in mortar, at 4*s.* 6*d.*	17	6	6
	280	lin.		Coping on edge, traverse way, at 3*d.*	3	10	0
			20	Deal stack-frames, 20 ft. × 12 ft., each containing 17 cube feet, at 1*l.* 17*s.*	37	0	0
			80	Iron supports to stack-frames, at 4*s.*	16	0	0
46	lin.	..	..	Tramway, 12 ft. gauge, in traverse wall, longitudinal for sleepers, dipped in creosote, rails 21 lb. per yard, complete	16	11	0
150	..	..	lin.	Tramway, 7 ft. 6 in. gauge, with transverse sleepers 4 ft. apart, 9 ft. long, at 6*s.*	45	0	0
			1	Threshing barn with corrugated iron covering, rolled iron standards, size 31 ft. by 18 ft.	32	0	0
			1	Lean-to same, for drum and engine ..	20	0	0
				Total	£191	17	6

Note.—No part of this amount is included in the general estimate of 2686*l.* 7*s.* 10*d.*

Hay-barns, 16 ft. wide and 16 ft. high (for covering either corn or hay), with corrugated-iron roof and rolled-iron standards, cost 1*l.* per foot lineal.

Alternative Estimate of Stack-Frames, Tram-Rails, and Turntable, together with Threshing-Barn, as shown in Plan No. 16A.

Yards.	Feet.	Inches.	No.		£	*s.*	*d.*
24	cube	..	..	Excavate soil to turntable, at 6*d.* ..	0	12	0
11	sup.	..	..	9 in. reduced brickwork, circular, at 5*s.* 6*d.*	3	6	6
1	50	lin.	..	Coping to same, circular, at 4*s.* ..	0	16	8
			18	Deal stack-frames, 20 ft. by 12 ft., at 37*s.*	33	6	0
			72	Iron supports to same, at 4*s.*	14	8	0
189	lin.	..	..	Tramway, 7 ft. 6 in. gauge, rails 21 lb. per yard, dogspiked to dipped sleepers 4 ft. apart, at 6*s.*	56	14	0
			1	Turntable and underworks, 16 ft. diameter, including bottom rails and wheels, and dipped batten framing	40	0	0
			1	Threshing barn with corrugated-iron covering, as described	32	0	0
			1	Lean-to same, as described	20	0	0
				Total	£200	17	2

Note.—No part of this sum is included in any previous estimate.

"Experientia."

Short Statement by the Author.

These buildings, according to the Plans, &c., forwarded herewith for competition, are entirely covered in with roofs the full area of the steading, consequently the servants attending the stock at nights and in stormy weather can do so with every comfort; the dung is also protected from the weather.

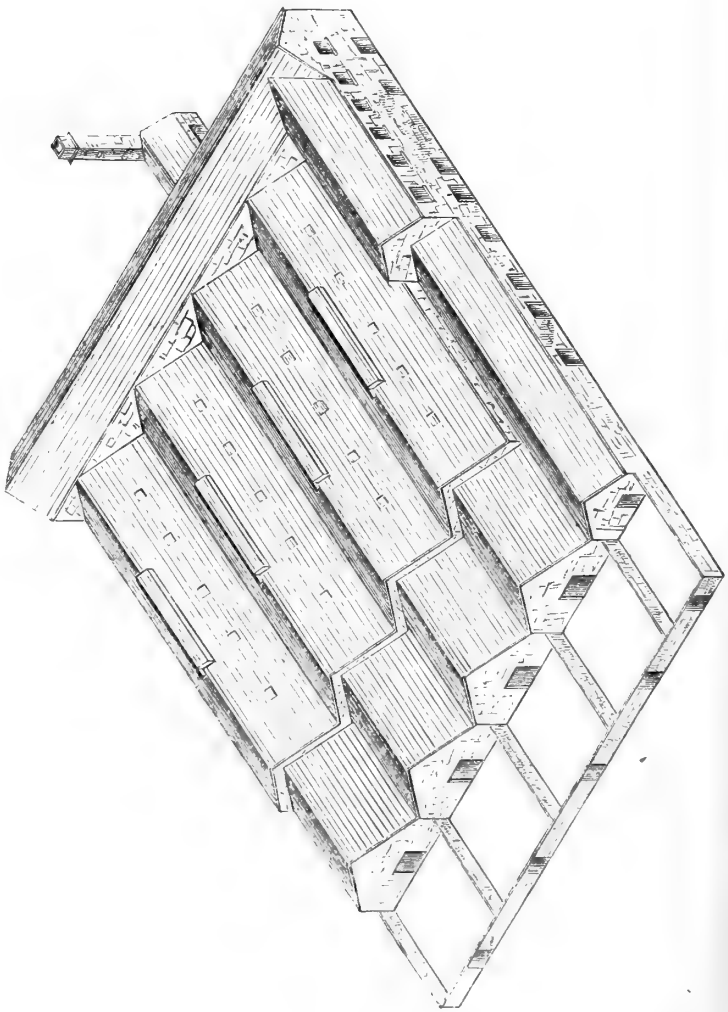
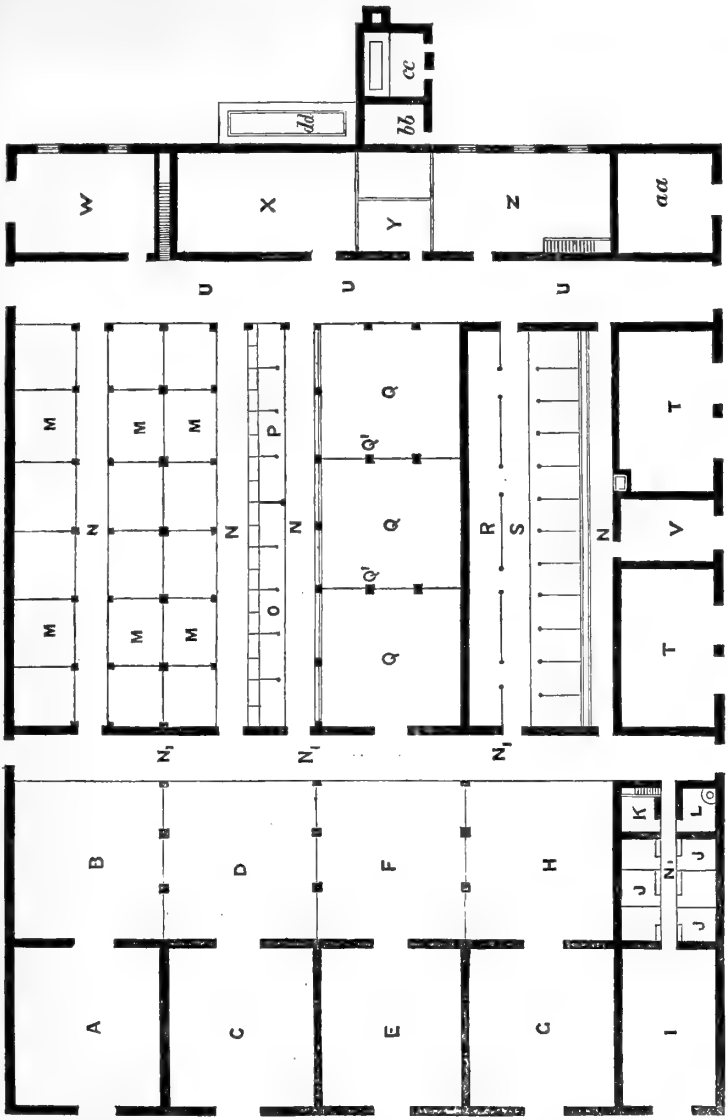


Fig. 6.—*View of Farm Buildings—"Experientia."*

The rails forming the boxes are movable, and can be taken out when required to make one open fold.

Fig. 7.—*Ground Plan of Farm Buildings for Arable Farm of 300 acres—"Experientia."*



A. Open fold.
B. Shed for sheep.
C. Open fold.
D. Shed for young cattle and dung court.
E. Open fold.
F. Shed for young cattle and dung court.
G. Open fold.
H. Shed for young horses.
I. Open fold for pigs.
J. Piggery.
K. Duck-house.
L. Boiling-house.
M. Feeding-boxes.
N. Feeding-passage.
N_1. Passage.
O. Stall for young cattle.
P. Stalls for dairy cows.
QQQ. Loose-box.
Q^1. Movable Partitions.
R. Harness-room.
S. Stable.
T T. Cart-sheds.
U. Passage way for carts.
V. Hay-house.
W. Turnips and fodder-house.
X. Straw-house.
Y. Chaff.
Z. Barn.
aa. Implements.
bb. Engine.
cc. Boiler.
dd. Saw-pit.

The doors can be fastened and locked at nights, so as to prevent any one having access to the building.

By extending or contracting the Plan, it can be made suitable for any sized farm, without at all interfering with the general arrangement or design.

Bill of Quantities and Detailed Estimate.

Excavator and Bricklayer.

	£	s.	d.
2500 cube yards of excavations, at 8s.	83	6	8
1200 ft. run of 4 in. socket drain pipe, at 6d.	30	0	0
2564 yards super. of main walls, at 4s.	517	16	0
228 „ yard walls, at 3s. 6d.	39	18	0
310 „ gables, at 4s.	62	0	0
438 „ retaining walls, at 3s. 6d.	76	13	0
70 „ 9 in. brick partitions, at 5s.	17	10	0
200 ft. cube of ashlar pillars, at 1s. 6d.	15	0	0
218 „ foundation to metal pillars, at 1s. 6d.	16	7	0
32 post stones chiselled and chamfered, at 2s. 6d.	4	0	0
180 ft. run of chiselled quoins, 2 ft. 6 in. girt, at 2s.	18	0	0
350 „ jambs to arches, 4 ft. girt, at 3s.	52	10	0
107 ft. cube of pillars to ditto, at 1s. 6d.	8	0	6
220 ft. run of arch stones, 3 ft. 9 in. girt, at 3s.	33	0	0
240 „ window jambs, at 2s.	24	0	0
170 „ door jambs, at 2s.	17	0	0
320 „ heads and sills to doors and windows, at 1s. 6d.	24	0	0
50 „ thresholds to arches, at 1s. 6d.	3	15	0
400 ft. cube of foundation stones to wood pillars, at 1s. 6d. ..	30	0	0
120 pillar stones to ditto, at 2s. 6d.	15	0	0
250 ft. run of coping to yard walls (rough), at 1s.	12	10	0
18 post stones to stalls, at 2s. 6d.	2	5	0
Sundries and contingencies	20	0	0
Total	£1122	11	2

Carpentry.

296 squares of roofing, at 30s.	444	0	0
430 ft. run of beam, 12 by 6, to pillars, at 1s.	21	10	0
1680 ft. super. of gutta board, 1½ in. thick, at 4d.	28	0	0
236 yards super. of joisting and flooring joints, 9 by 3, flooring 1¼ in. feathered and grooved, at 5s. 6d.	64	18	0
128 yards super. of ditto, joists 11 by 3, at 6s. 6d.	41	12	0
275 ft. run of ¾ in. skirting, 6½ in. high, to granary, at 3d. ..	3	8	9
1 trap door in granary floor	1	0	0
1 wood spout from granary to corn-bin	1	0	0
220 ft. super. of sashes and frames (louvres), at 1s. 6d.	16	10	0
110 „ plain sashes and frames, at 1s. 4d.	7	6	8
792 „ 1¼ in. feathered and grooved doors, at 8d. ..	26	8	0
36 „ ditto to piggeries, &c., at 8d.	1	4	0
420 „ 1¾ framed and battened doors, at 1s.	21	0	0
158 „ ditto ditto , at 1s.	7	18	0
40 yards super. of batten joisting and flooring to poultry house, at 4s.	8	0	0
230 ft. run of lintels, 16 in. by 4 in., at 1s.	11	10	0
210 ft. super. of 1½ treads and risers to stairs, at 8d.	7	0	0
Carried forward	£712	15	5

		£	s.	d.
	Brought forward	712	15	5
64 ft. run of string to ditto, 11 by 2, at 1*s*.		3	4	0
240 ft. super. of 1 in. partition to ditto, at 6*d*.		6	0	0
210 ft. run of dressed posts 10 by 4, at 6*d*.		5	5	0
150 „ „ 10 by 8, at 1*s*.		7	10	0
180 „ „ 5 by 4, at 4*d*.		3	0	0
210 „ „ 4½ by 3, at 3*d*.		2	12	6
60 „ „ 3 by 2, at 2*d*.		0	10	0
130 „ „ 6 by 6, at 6*d*.		3	5	0
1590 „ rails, 5½ by 3, at 4*d*.		26	10	0
96 ft. super. of stall partition to byres, at 8*d*.		3	4	0
570 „ ditto to stable, 2¼ in. thick, at 8*d*.		19	0	0
210 ft. run of feeding troughs, at 2*s*.		21	0	0
70 „ ditto to byres, at 2*s*.		7	0	0
660 ft. super. of 1¼ in. partition to harness room, at 6*d*.		16	10	0
Extra labour to 3 doors in ditto, at 5*s*.		0	15	0
420 ft. super. of ditto in front of stables, at 6*d*.		10	10	0
Extra labour to 14 doors in ditto, at 5*s*.		3	10	0
42 ft. run of hay-rack, at 2*s*.		4	4	0
42 „ manger, at 2*s*. 6*d*.		5	5	0
70 „ scantling, 9 by 1½, to stable partition, at 4*d*. ..		1	3	4
270 „ post to piggeries, 4½ by 4½, at 4*d*.		4	10	0
380 super. of 1¼ partition to ditto, at 6*d*.		9	10	0
Extra labour to 5 doors to ditto, at 5*s*.		1	5	0
56 ft. run of feeding-troughs, at 2*s*.		5	12	0
80 „ Memel gate-posts, 14 by 10, at 2*s*.		8	0	0
160 „ gates, battened and braced, at 1*s*.		8	0	0
1 corn-bin complete		2	0	0
650 ft. super. of 1½ partition to barn, at 6*d*.		16	5	0
Making centres for arches		2	0	0
Sundries and contingencies		20	0	0
Carried to Summary		£939	5	3

Iron Work and Hardware.

	£	s.	d.
27 cast-iron pillars, at 20*s*.	27	0	0
9 sets of iron work for sliding doors, at 30*s*.	13	10	0
12 sets of stall divisions, at 25*s*.	15	0	0
18 sets of small stall divisions, at 15*s*.	13	10	0
12 pairs of crooks and bands, 30 in. long, at 10*s*.	6	0	0
9 „ crooks to piggeries, at 5*s*.	2	5	0
132 ¾-in. screw-bolts to iron pillars, 12 in., at 1*s*. 6*d*.	9	18	0
132 Ditto ditto 8 in., at 1*s*.	6	12	0
65 ⅝-in. ditto to cattle-troughs, at 1*s*.	3	5	0
88 ⅝-in. iron pins to ditto, 9 in. long, at 1*s*.	4	8	0
12 sets of opening cranks to louvres, at 10*s*.	6	0	0
4 sets of hinges, &c., to swing doors to piggery, at 5*s*.	1	0	0
4 pairs of cranks and bands to fold gates, at 30*s*.	6	0	0
78 ⅝-in. iron bolts to stall posts, at 1*s*.	3	18	0
14 ¾-in. ditto ditto at 1*s*.	0	14	0
75 iron pins to support slip rails, at 6*d*.	1	17	6
12 stock locks, at 5*s*.	3	0	0
Carried to Summary	£123	17	6

Slating.

	£	s.	d.
3484 yards super. of slating, at 3*s.*	522	12	0
1736 ft. run of ridge stone, at 8*d.*	57	17	4
84 squares of rough plate-glass lights, at 5*s.*	21	0	0
Pointing fillets with cement	5	0	0
Carried to Summary	£606	9	4

Plumbing and Spouting.

	£	s.	d.
95 cwt. of lead to gutters, at 1*l.* 8*s.*	133	0	0
680 ft. run of metal spouting, 5 by 3½, fixed with iron bracket holdfasts, at 8*d.*	22	13	4
320 ft. run of 3-in. down-pipes, at 8*d.*	10	13	4
18 heads to down-pipes, at 2*s.* 6*d.*	2	5	0
18 shoes to ditto, at 2*s.*	1	16	0
Carried to Summary	£170	7	8

Plaster Work and Cementing.

	£	s.	d.
170 yards super. of 1 coat cement on walls of granary, at 1*s.* 6*d.*	12	15	0
1270 „ concrete cement flooring to stables, byres, piggeries, straw-house, barn, passages, &c., part to be grooved, at 2*s.* 8*d.*	169	6	8
Carried to Summary	£182	1	8

Painting and Glazing.

	£	s.	d.
110 ft. super. of crown glass to windows, well bedded in oil putty, at 1*s.*	5	10	0
480 yards super. of 4-coat painting to wood-work, metal spouting, &c., at 9*d.*	18	0	0
Carried to Summary	£23	10	0

Summary.

	£	s.	d.
Masonry	1122	11	2
Carpentry	939	5	3
Iron Work	123	17	6
Slating	606	9	4
Plumbing, &c.	170	7	8
Plastering, &c.	182	1	8
Painting and glazing	23	10	0
Total	3168	2	7

"Practice with Economy."

Description by the Author.

This design is for buildings suitable for a 400-acre farm, 300 of which are arable and 100 pasture. My aim has been to give ample accommodation in the most approved manner and at the least cost, combined with the use of the most durable materials and with workmanship of the best description. To attain this end I have "grouped" or "attached" the buildings as much as possible, without sacrificing light, ventilation, or convenience. Although they are not all in one group, their doors all open *inwards*, so that the entire set form their own roadways, without any additional walling or fencing than that shown on the plan. I have also endeavoured, by studying the arrangement of parts, to lessen the labour on the part of the farmer in his superintendence of operations, and also of his men in their attendance upon the stock. These can be quickly fed, and their dunging out can almost be done with a cast of the shovel over the low walls which run from pier to pier, and separate the stalls and pigsties from the yards. There are also doors provided for this purpose; and it will be seen that every one of the four covered yards will receive a part of the manure from the stalls to be trodden in with that made by the animals running in them.

As it is necessary that this description should be as concise as possible, I will call attention as briefly as I can to the points which I consider are most worthy of notice, or which are otherwise necessary to convey to the reader a fair conception of the ideas embodied in my plan. I wish to call particular attention to my mode of ventilation by means of air-shafting under the mangers, which is spoken of further on.

General Construction and Arrangement.—The whole is built of brick and slated, the covered yards being only what is termed half slated. The stable, cowhouse, and food-store floors are cement, concreted for the sake of cleanliness and durability. The feeding-passages are the same, and being thus very smooth, a tramway is unnecessary. Glazed-ware manger-blocks are used throughout, both for cattle and horses, as they are strong and clean. The drains are of glazed-ware socket-pipes, and run direct from cesspool to cesspool, to facilitate examination and cleaning out without disturbing the flooring or drains themselves. Drains are put in the covered yards, but they would only require to be used when litter was very scarce; they could be plugged up at other times. Water is supplied to yards and boxes by pipes from a large tank forming part of the roof over the steaming-house. This tank can be filled by pumping by steam-power out of a well to be sunk near, if a supply of water is not otherwise obtainable.

To make the plan as generally useful as possible, and suited for additions or modifications as might be required by local circumstances, if ever it was erected, I have designed it in two parts, and have given separate estimates for each—the main block, with the east and west ranges, forming one part, and the open yard block to the south forming the other part. The walls dividing the cow-house and pigsties from the yards are only 4 ft. 6 in. high between the piers. This economises material and causes a free circulation of air.

Ventilation.—Although the main block is "grouped" to save walling, ventilation is not sacrificed. In addition to the usual supply of windows and ventilating bricks, the eaves of the covered yard roofs are carried, by means of the pillars, high enough to give an opening all their length and 12 inches deep above the eaves of the stable and pigsty ranges. This causes a current of air from east to west, or *vice versâ*, quite across the covered yards and cow-house, notwithstanding the abutment of the stables and pigsties, and the amount may be regulated by shutters or louvre boarding. Ventilating shafts

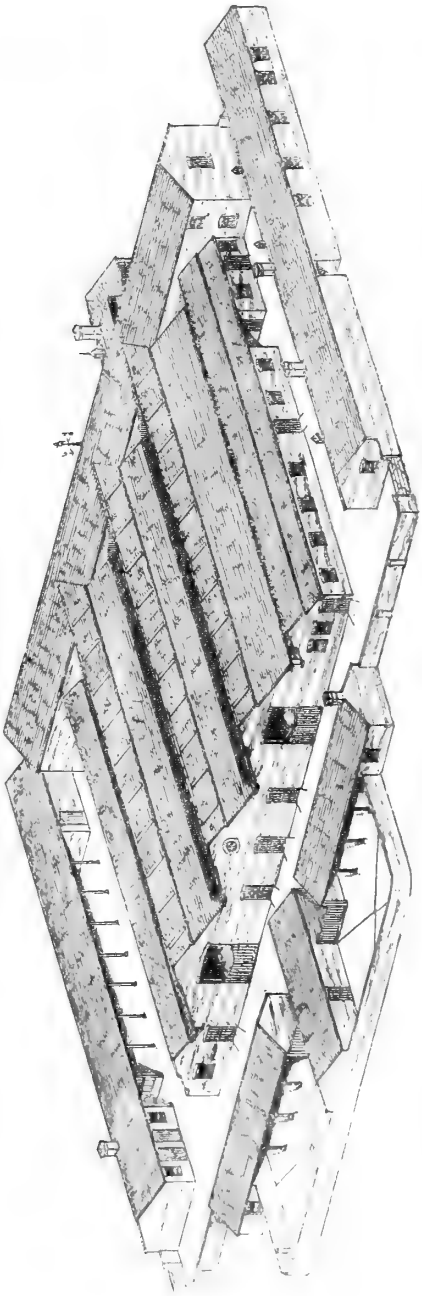
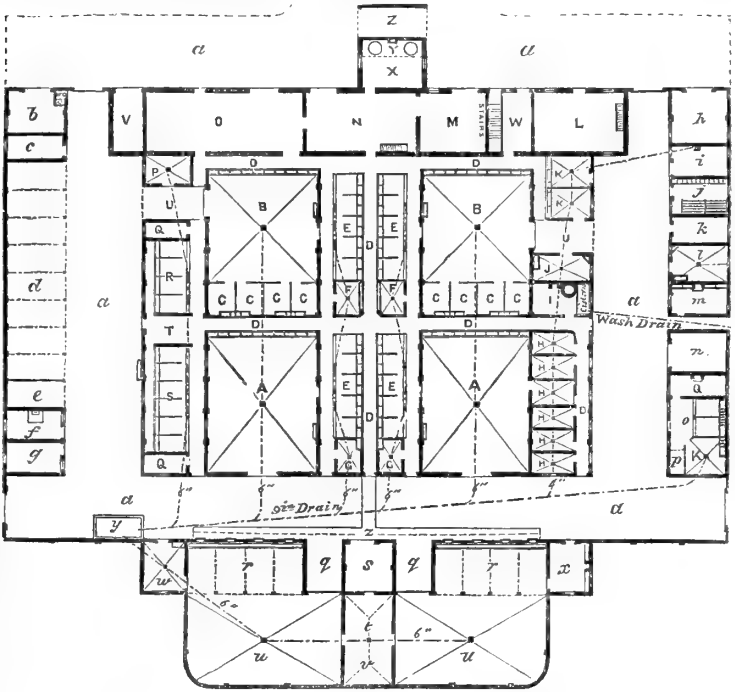


Fig. 8.—*View of Farm Buildings—"Practice with Economy."*

Fig. 9.—*Plan of Farm Buildings*—"*Practice with Economy.*"



A A.	Covered yard for 10 beasts.	N.	Mixing-floor.
B B.	Ditto ditto 8 beasts.	O.	Straw-barn.
C C C C C C C.	Boxes.	P.	Box for horse.
D D D D D D.	Feeding-passages.	Q Q Q.	Harness.
E E E E.	Cow and bullock-stalls.	R.	4-horse stable.
F F.	Calves.	S.	6-horse stable.
G G.	Box or calves.	T.	Hay and chaff.
H H H H H H.	Pigs or loose-boxes.	U U.	Covered entrance to yard.
I.	Boiling-house.	V.	Portable threshing-machine.
J.	Bull-house.	W.	Fodder.
K K.	Loose-boxes.	X.	Steaming-house.
L.	Winnowing floor.	Y.	Suggested apparatus.
M.	Root-house.	Z.	Portable engine-shed.

a a a a a.	Roadway.	*m.*	Office and master's stores.
b.	Implements.	*n.*	Gig-house.
c.	Tools.	*o.*	Hackney stable.
d.	Waggons, carts, and implements.	*p.*	Hay.
e.	For shoeing horses.	*q.*	Entrances to open yards.
f.	Blacksmiths' shop.	*r r.*	Sheds.
g.	Carpenters' shop.	*s.*	Food stores.
h.	Reaping machines, drills, or artificial manures.	*t.*	Sheep shed.
i.	Slaughter-house.	*u u.*	Open yards.
j.	Fowl-house.	*v.*	Portable fittings.
k.	Poultry.	*w.*	Box for mare and foal.
l.	Infirmary.	*x.*	Shepherd's stores.
		y.	Liquid manure.
		z.	Concrete feeding-path.

are constructed under the mangers adjoining the feeding-passages with common 12-inch pipes, laid from the outside walls, and having air brick-openings every 10 feet apart. The air thus admitted comes into the lower parts of the centre of the buildings, where it is most wanted, and will conduce greatly to the health of the animals standing continually opposite to each other in the stalls. In the roofs of all buildings occupied by horses, cattle, and pigs, the ordinary louvre boarding is dispensed with, and an opening 3½ inches deep for ventilation is provided by putting a "pitching" piece on to the rafters, resting on the upper purlin, and footing the short top rafters on to it. This is carried all along both sides of the roof, and is more economical than louvres.

Food Stores.—It will be seen that the straw and various sorts of cattle food, as well as the means of converting and mixing the same, are placed as near to each other as possible, and convenient for feeding stock at any part of the farmery by means of the feeding-passages. The second story, comprising the chaff-cutting floor over the mixing-floor, the corn and cake store over the turnip-house, and the granary over the winnowing-floor, are all easily accessible from the inside or outside of the building for unloading into or otherwise. The mixing-floor has a pair of doors large enough to admit a cart, which will be found useful in many ways.

Portable Engine-Shed, and Shafting.—The main shaft is worked by the portable engine as it stands in the engine-house, and runs through the steaming-house into the centre of the food apartments to drive the machinery required in any of them. The engine can be drawn to its position in the shed without any "backing," which is no small advantage. The house is built low to save building material, and necessitates the funnel being turned down when drawn in and remaining so. There is, however, a fixed funnel in the roof, with a telescopic slide to drop on the engine to take the smoke when in use cutting chaff, &c.

Straw Barn.—A waggon can be admitted here to unload hay, &c., under cover on to the cutting-floor, or corn and cake for the corn-room beyond. Grain for market from the granary can be hand-trucked, and loaded here in the dry. The first stack for threshing after harvest might also be stored here, and threshed by the portable engine being admitted through the large doors. The straw could be stored on the chaff-cutting floor or in one of the covered yards.

Stables.—Chaff and pulped or cooked food can be brought here with great facility from the main food-stores. The feeding-passage in front has many advantages, not the least being the ample supply of light and air which can be admitted and circulated by means of the windows in *front* of the horse. There is also a direct communication with the straw-barn for supplying litter, which, when soiled, can be removed easily by putting it through the shutters provided for the purpose into the covered yards. The walls between the stable and yards are built up eaves high, to sever all communication. In this respect they differ from those of the cowhouses and pigsties.

Cart Shedding.—This faces the best aspect, the east. The tools are also kept here, all to be at hand as near as possible to the stables when required.

Loose Boxes.—These are only provided to a limited extent, the covered yards being thought more desirable on account of their general utility. There is, however, quite a sufficient supply for any animals which may be found to thrive best in separate quarters.

Pigsties.—The manure made in these is easily cast over the dwarf walls which separate them from the yards. The food is close at hand in the boiling-house, with its wash-drain direct from the house into the cistern. Should, however, the food be prepared in the steaming-house, or if they are used as loose-boxes for cattle, for which they are equally suitable, there is direct and easy communication by means of the feeding-passages.

Granary.—This is over the winnowing-floor, and has easy communication with the corn and cake store, to which place any refuse corn could easily be removed to be ground for stock. Steps are provided from the winnowing-floor below, and also a door for winding-up sacks from the outside. These are in addition to the stairs from the roadway.

Calf Pens.—These are not usually required to be very large on an arable farm, and only moderate accommodation is provided. The boxes at the lower end of the cowhouse, however, are easily available if more room is required.

Infirmary.—This is apart from the other places for stock, and near the supposed position of the house, so as to have easy access at night. The drain runs to an isolated tank, to prevent infection by connection with the other system of drainage.

Slaughter-house.—This has the advantage of being near to the infirmary, for slaughtering any animal found incurable and difficult to move.

Fowl and Poultry-houses.—The doors of these could be put on the other side of the building, if desired to open into a poultry-yard proper, which could be got at by the mistress from the back of the supposed house without entering the farmery.

Office and Master's Stores.—This will be found useful for many purposes, storing and mixing medicines, &c., and is close to the infirmary.

Open Yards and Sheep Sheds.—The sheep shed is placed between the two yards, that it may be useful for lambing-pens when required, the flock having the run of one or both of the yards and shelter of their sheds. These yards are intended for cattle, young horses, or sheep, as may be required, and are easily fed from the main stores. The sheep shed is small, but can easily be extended in its present position. It is not fitted up; this is left for the tenant to do in a portable manner, that it may serve the many purposes for which it is adapted in turn, such as fattening a few sheep, housing sick or cripples, or bringing forward a pen or two for showyard purposes. It will be seen that the shepherd's store with fireplace is near at hand.

Steward's Office, Sundorne, Shrewsbury, Sept. 1879. A. Dudley Clarke.

Bill of Quantities and Detailed Estimate.

Part I.—*For the Main Block of Buildings and East and West ranges (exclusive of the block of open yards and shedding to the South, but including the boundary wall from East to West, against which they are built).*

Yards.	Feet.	Inches.	No.		£	*s.*	*d.*
				Excavator, Bricklayer, and Slater.			
445 Rods.	cube	..	..	Excavating and ramming and wheeling away, at 7*d.*	12	19	7
101½ Rod.	..	..	..	Reduced brickwork in mortar, at 11*l.* 15*s.*	1192	12	6
1	20	..	..	Reduced brickwork in cement to manure tank, at 15*l.*	16	2	0
			4	Yards dished and rammed, at 2*l.* 10*s.*	10	0	0
			2	Calf-houses, dished and rammed, under sparred floors	0	17	6
			4	Cesspools of 4½ in. brickwork, including stone frames and 18 in. grates, complete, at 1*l.* 7*s.* 6*d.*...	5	10	0
				Carried forward .. .. ..£	1238	1	7

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Brought forward	1238	1	7
			29	Cesspools, including 9 in. grates with iron frames, complete, at 14*s.* ..	20	6	0
280	run	..	..	6 in. earthenware socket manure drain, jointed with clay and excavating, at 2*s.* 3*d.*	31	10	0
37	run	..	..	9 in. earthenware socket manure drain, jointed with clay and excavating, at 3*s.*	5	11	0
			6	Junctions, at 2*s.* 6*d.*	0	15	0
			3	Syphon traps, at 5*s.*	0	15	0
				Allow for small manure tank, 3 ft. by 3 ft. by 3 ft., near infirmary, and cover, complete	1	6	0
500	run	..	..	6 in. main water-drains and excavating, at 9*d.*	18	15	0
40	run	..	..	3 in. branches to ditto, at 6*d.*	1	0	0
			40	Junctions, at 6*d.*	1	0	0
			40	Bends at feet of down-pipes, at 3*d.*	0	10	0
20	run	..	..	Glazed socket wash-drain, jointed in clay and excavating, at 2*s.*	2	0	0
	271	6	run	Extra to rebated jambs, with bull-nosed arris, at 2*d.*	2	5	3
	1670	run	..	Extra to bull-nosed arris to piers, door-jambs, &c., at 1*d.*	6	19	2
	86	run	..	Extra to 1½ brick rebated and bull-nosed arches, at 4½*d.*	1	12	3
	141	run	..	Extra to 1 brick rebated and bull-nosed arches, at 4*d.*	2	7	0
	320	run	..	Extra to 1 brick plain and bull-nosed arches, at 3*d.*	4	0	0
	130	run	..	Extra to ½ brick plain and bull-nosed arches, at 2*d.*	1	1	8
	197	run	..	Extra to chamfered blue-brick window-sills, at 2*d.*	1	12	10
	320	run	..	Plain 12 in. earthenware ventilating pipes under mangers, at 1*s.*	16	12	0
			12	Bends to earthenware ventilating pipes under mangers, at 4*s.*	2	8	0
			26	3 in. outlets to earthenware ventilating pipes under mangers, at 6*d.* ..	0	13	0
			26	9 by 3 iron gratings to cover outlets, at 9*d.*	0	19	6
			4	Large grates to 12 in. pipes outside buildings, at 4*s.*	0	16	0
			68	Hook stones, 14 by 14 by 9, at 3*s.* 6*d.*	11	18	0
			8	Plinth stones, dowelled for posts, at 6*s.* 6*d.*	2	12	0
			1	Iron boiler and furnace built in brick, case complete	3	0	0
	688	run	..	Half-round coping in mortar, at 5*d.*	14	6	8
	1483	run	..	Extra to brick cornice in mortar, at 1½*d.*	9	5	4
	210	sup.	..	Cementing to wash-tank, at 3*d.* ..	2	12	6
	128	sup.	..	Stone slab cover to manure tank, at 1*s.*	6	8	0
				Carried forward .. .. £	1412	18	9

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Brought forward	1412	18	9
				Manhole and cover to manure-tank, extra	0	5	0
			70	Building 4½ in. work round posts in cowhouse, and other concrete flooring, at 2*s.*	7	0	0
			5	Chimney caps finished to drawings, at 4*s.*	1	0	0
			5	Flues parged, at 2*s.* 6*d.*	0	12	6
			24	9 by 6 air-bricks, at 1*s.* 3*d.*	1	10	0
				Allow for sheet-iron dome to flue of blacksmith's shop and iron kerb to hearth	2	0	0
11	3	sup.	..	Hard brick on edge in cement to liquid manure-tank floor, at 5*s.* ..	2	16	8
1360	sup.	..	..	6 in. concrete flooring, including bed of hard building rubbish, at 3*s.* 6*d.*	238	0	0
39	sup.	..	..	Blue-brick paving in mortar, at 4*s.*	7	16	0
375	sup.	..	..	Pitching with pebbles in sand, levelling and ramming for same, at 1*s.*	18	15	0
	19	3	sup.	Flooring squares in mortar to hackney-stable low-racks, at 8*d.* ..	0	12	10
	212	run	..	Concrete dished for drains extra, at 2*d.*	1	15	4
	128	run	..	Blue-brick door-sills in cement, at 6*d.*	3	4	0
			18	Extra for posts to stable, bedded in concrete, raised to form plinth for same, at 9*d.*	0	13	6
	425	run	..	Glazed stoneware manger blocks, divisions and ends, in mortar, at 3*s.* 6*d.*	74	7	6
	16	run	..	Glazed stoneware manger blocks, divisions and ends, in cement for water, at 4*s.*	3	4	0
			3	Sets of bars for fireplaces, and built in, at 5*s.*	0	15	0
			1	Plain stone mantel and shelf to office	0	17	6
			2	Angular stone water-troughs, at 6*s.* 6*d.*	0	13	0
	1100	run	..	Extra for beam-filling, at 2*d.*	9	3	4
			64	Dowel stones and dowels to door-frames, at 2*s.* 3*d.*	7	4	0
				Allow for bedding all roof and bond timbers, lintels, &c.	3	0	0
				Allow for fixing shaft-bearings and forming holes for driving-straps ..	1	10	0
Squares.							
182¾	sup.	..	..	Best Bangor Duchess slating, at 2*l.*	365	10	0
94¼	sup.	..	..	Ditto ditto half-slating to covered yards, at 1*l.* 13*s.*	155	10	3
	418	run	..	Cutting to gables and valleys, at 1½*d.*	2	12	3
	1000	run	..	Plain blue crest tile in mortar, at 6*d.*	25	0	0
Yards.	350	run	..	Cement filleting, at 1½*d.*	2	3	9
56	sup.	..	..	Render and set to office walls, at 8½*d.*	1	19	8
24½	sup.	..	..	Lath, plaster, and set-to rafters of office walls, at 1*s.* 4*d.*	1	12	8
				Carried to Summary .. £	2354	2	6

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				CARPENTER AND JOINER.			
	3925	cube	..	Fir timber in roofs, joists, lintels, bond timbers, &c., at 3*s*.	588	15	0
	202	cube	..	Oak in posts and rails to boxes and door-posts to pigsties, at 5*s*. 6*d*. ..	55	11	0
Squares.							
7	78	sup.	..	1 in. wrot. deal floor laid folding, at 1*l*. 10*s*.	11	2	6
13	20	sup.	..	1¼ in. grooved and tongued deal floor laid folding, at 2*l*..	26	8	0
2	10	sup.	..	1 in. rough deal floor laid folding, at 1*l*. 2*s*.	2	6	2
1	75	sup.	..	4 by 1½ sparred flooring, 1¼ in. apart, to calf-houses, at 1*l*. 5*s*.	2	3	9
1	44	sup.	..	Partition in waggon shed, at 1*l*. 5*s*.	1	16	0
3	20	sup.	..	Partition in granary and fodder store, at 1*l*. 7*s*. 6*d*.	4	7	10
	1015	sup.	..	2½ in. framed, ledged, and braced doors, filled in with 1 in. ploughed and tongued boards, and painting, at 1*s*. 10½*d*.	95	3	1
	370	sup.	..	2 in. framed, ledged, and braced doors, filled in with 1 in. ploughed and tongued boards, and painting, at 1*s*. 9*d*...	27	7	6
	1047	sup.	..	1 in. ledged and braced doors filled in with 1 in. ploughed and tongued boards, and painting, at 1*s*. 1*d*. ..	56	14	3
	21	9	sup.	2 in. 4 panel square doors, filled in with 1 in. ploughed and tongued boards, and painting, at 1*s*... ..	1	1	9
	856	run	..	7 by 1¼ ridge, at 2*d*...	7	2	8
	80	run	..	9 by 1¼ valleys, at 2½*d*.	0	16	8
	231	run	..	Herring-bone struts, at 3*d*.	2	17	9
	397	run	..	12 by 1¼ deal back to manger, tongued, at 3½*d*.	5	15	9
	567	run	..	5 by 4 rebated door frames and painting, at 9½*d*.	22	8	10
	47	run	..	Chamfered capping to doors and painting, at 2*d*.	0	7	10
	60	run	..	Rack and manger sill (oak) in cart stables, at 3*s*.	9	0	0
Square.							
1	43	sup.	..	Of loose-box partition in hackney stable, at 1*l*. 15*s*.	2	10	6
	5	3	sup.	1½ W. C. seat with dished hole on bearers, at 8*d*.	0	3	6
	4	6	sup.	1 in. front to W. C., at 6*d*.	0	2	3
				Allow for 4 cupboards in office, complete	5	0	0
	36	run	..	18 by 1¼ deal shelving and bearers, at 1*s*.	1	16	0
	130	sup.	..	1 in. deal laying boxes and brackets, at 7*d*.	3	15	10
	48	sup.	..	Treads to stairs, 1¼ in., at 1*s*.	2	8	0
	44	sup.	..	Risers to stairs, 1 in., at 10*d*.	1	16	10
	30	run.	..	9 by 3 deal strings housed, at 8*d*. ..	1	0	0
				Carried forward .. .. £	939	19	3

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	*s*	*d.*
				Brought forward			
	72	run	..	Strutting pieces to roosting-perches, at 3*d.*	0	18	0
	300	run	..	2 in. round perches on roosting-pieces, at 1½*d.*	1	17	6
				2 oak pieces for sack hoisting, built in walls of granary and corn-room	0	10	0
			16	Small divisions (travises) in cow-house, at 1*l.* 5*s.*	20	0	0
			4	Large divisions (travises) in cow-house, at 1*l.* 10*s.*	6	0	0
			9	Divisions in cart and hackney stables, at 2*l.*	18	0	0
			3	Low wooden racks to hackney stable, at 10*s.*	1	10	0
			14	Oak posts, 9 ft. 6 in. long, cased 7 ft. 6 by 5 for loose-boxes, at 7*s.* 6*d.* ..	5	5	0
			2	Step ladders, at 1*l.* 2*s.* 6*d.*	2	5	0
			1	Large and 3 small ventilators, with zinc roofs, complete, and painting, at 12*s.* 6*d.*	2	10	0
			53	Windows, averaging 4 ft. by 3 ft. 6 in. complete, including glazing of upper part and slides for ventilation to lower part, painting, &c., at 1*l.* 6*s.*	68	18	0
			1	Large mullion window with iron casement and glazing and painting, complete	2	0	0
			70	Skylights formed with 2 by 1 strips, nailed on sides of rafters, including glazing, at 4*s.* 6*d.*	15	15	0
			10	Small shutters and slides to "bull's-eye" openings to barn, &c., and painting, at 5*s.* 6*d.*	2	15	0
			1	Swing shutter to cow-house and painting	0	7	6
			4	10 ft. oak roadway gates, strong posts, hinges and latches, complete, at 2*l.* 5*s.*	9	0	0
				Extra to hanging 7 doors in halves, at 1*s.* 6*d.*	0	10	6
				Pair butts and rim lock to office door	0	4	6
			90	Pairs wrot.-iron hinges and hooks, painting and fixing, at 6*s.*	26	0	0
			83	Wrot.-iron drop latches and painting and fixing, at 2*s.* 6*d.*	10	7	6
			12	Strong wrot.-iron door bolts and painting and fixing, at 2*s.*	1	4	0
			16	8 in. stock locks, at 2*s.* 3*d.*	1	16	0
			3	Sunk latches to stable doors, at 3*s.* ..	0	9	0
			3	Dung-doors and frames complete, at 5*s.*	0	15	0
			1	Ledged trap-door and hinges to granary, at 7*s.* 6*d.*	0	7	6
				Carried forward .. .. ..£	1139	4	3

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Brought forward	1139	4	3
			1	18 in. galvanized-iron bucket to W.C.	0	7	6
				Allow for fixing No. 54 tie rods, 18 single and 18 double shoes, and 54 straps to collars provided in Ironfounder	5	5	0
			24	Wood pegs in harness rooms, at 6*d.*	0	12	0
				Carried to Summary .. £	1145	8	9
				IRONFOUNDER AND PLUMBER.			
			1	Strong wrought-iron water tank, to hold not less than 3000 gallons, and painting inside and out ..	50	0	0
			3	Wrought rolled joists, 7 in. by 4 in., and 17 ft. 6 in. long, and painting for supporting ditto	3	5	0
			4	Cast-iron water troughs, 4 ft. by 1 ft. 4 in. by 1 ft. 2 in., with protection for ball-cock, at 50*s.* ..	10	0	0
			1	Do. do. 6 ft. long, with ditto ..	3	0	0
			6	Cast-iron movable pigsty troughs, at 7*s.* 6*d.*..	2	5	0
			18	Single cast-iron shoes and painting, at 2*s.* 6*d.*..	2	5	0
			18	Double ditto, at 4*s.*	3	12	0
			54	Straps and bolts to collars, wrought iron, at 4*s.* 6*d.*	12	3	0
	1010	run	..	⅞-wrought-iron tie rod-nuts, washers, and painting complete, at 5*d.* ..	21	0	10
			1	Cast-iron weathercock, painting and fixing	1	10	0
			1	Fixed funnel to portable engine-house, 10 ft. long, and 4 ft. telescopic slide of strong riveted sheet-iron, and suspending chains, complete..	2	0	0
			3	Cast-iron angle racks, at 8*s.*	1	4	0
			40	⅝ iron stanchions for cowties, at 1*s.* 9*d.*	3	10	0
			13	Stall rings and staples to stable, at 8*d.*	0	8	8
431	run	..	..	4 in. square cast-iron gutter to eaves, with the requisite down-pipes, heads, outlets, stop-ends, &c., and painting, at 1*s.* 9*d.*	37	14	3
49½	run	..	..	3 in. iron water-supply pipe for main, including angles and junctions, and coated with Dr. Angus Smith's solution, at 2*s.* 6*d.*..	6	3	9
120	..	..	..	1 in. galvanized-iron ditto, for branches to taps and water troughs, including necessary bends and junctions, at 2*s.*.. ..	12	0	0
			5	Ball-cocks, at 7*s.* 6*d.*	1	17	6
				Carried forward .. .. £	173	19	0

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Brought forward	173	19	0
			8	Brass taps to loose-boxes, cow-house, &c., at 5*s.*	2	0	0
			1	Hydrant, fixing and connecting to 3 in. main water-supply	3	0	0
Cwt. 35	lbs. 16	..	..	Milled lead in gutters and valleys, &c., at 25*s.*	33	18	6
			30	King pins to principals	3	15	0
				Carried to Summary	£216	12	6
				(The glazing is charged with the Carpenter work, as is also the painting.)			
				SUMMARY.			
				Excavator, bricklayer, and slater ..	2354	2	6
				Carpenter and joiner	1145	8	9
				Ironfounder and plumber	216	12	6
				Total of Part I. .. .. £	3716	3	9

PART II.—*Separate Estimate for Open Yards, Shedding, &c., built on to the South side of South boundary wall.*

Yards.	Feet.	Inches.	No.	EXCAVATOR, BRICKLAYER, AND SLATER.	£	s.	d.
33	cube	..	..	Excavating, wheeling, and ramming, as before, at 7*d.*	0	19	3
	$8\frac{3}{4}$	rods	sup.	Brickwork in mortar, at 11*l.* 15*s.* ..	102	16	3
			2	Yards, dished and rammed, at 2*l.* 10*s.*	5	0	0
			2	Sheds to ditto, sloped and rammed	2	0	0
			2	Cesspools, 18 in. strong grates and stone frames, at 1*l.* 7*s.* 6*d.*	2	15	0
			2	Cesspools, 9 in. iron grates and iron frames, at 14*s.*	1	8	0
			1	Chimney cap, finished to drawing, at 4*s.*	0	4	0
			1	Set of bars and building in fire-place, at 5*s.*	0	5	0
			1	Flue parged	0	2	6
			6	Plinth stones dowelled for posts, at 6*s.* 6*d.*	1	19	0
	45	run	..	Rebated and bull-nosed door-jambs, at 2*d.*	0	7	6
	30	..	..	Extra to bull-nosed angles only, at 1*d.*	0	2	6
	18	6	..	Extra to 9 in. rebated and bull-nosed arches, at 4*d.*	0	6	2
	56	..	..	9 in plain do. do., at 3*d.*	0	14	0
				Carried forward .. .. £	118	19	2

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Brought forward	118	19	2
	24	..	..	4½ in. do. do. do., at 2*d.*	0	4	0
	41	..	..	Chamfered blue-brick window-sills, and sills for feeding-doors, at 2*d.*	0	6	10
			8	Hook stones, 14 by 14 by 9, at 3*s.* 6*d.*	1	8	0
			16	Hook stones, 9 by 9 by 6, to feeding-doors, at 2*s.* 6*d.*	2	0	0
42	run	..	..	6 in. earthenware socket drain and excavating, at 2*s.* 3*d.*	4	14	6
90	..	..	..	3 in. rain-water drain and ditto, at 6*d.*	2	5	0
			12	Bends to ditto, at 3*d.*	0	3	0
	386	run	..	Extra to brick cornice, at 1½*d.* ..	2	2	3
	4	..	..	Blue-brick sill, at 6*d.*	0	2	0
	4	run	..	Glazed stoneware manger, at 3*s.* 6*d.*	0	14	0
	312	..	..	Beamfilling, at 2*d.*	2	12	0
			12	Dowel stones for door-jambs and dowels, at 2*s.* 3*d.*	1	7	0
				Extra for setting roof-timbers, door-frames, bond, &c.	1	5	0
172	sup.	..	..	Concrete flooring and bed for same as before (this includes the feeding paths across and along the roadway), at 3*s.* 6*d.*	30	2	0
70	..	..	..	Pitching with stones in sand, and ramming, at 1*s.*	3	10	0
	32¾	sqrs.	..	Bangor Duchess slating, at 2*l.*.. ..	65	10	0
	120	run	..	Cutting to gables, at 1½*d.*	0	15	0
	156	..	..	Plain blue-tile ridge, at 6*d.*	3	18	0
				Carried to Summary	£241	17	9
				CARPENTER AND JOINER.			
	313	6	cube	Fir in roofs bond lintels, at 3*s.* ..	47	0	6
	156	run	..	7 by 1¼ ditto, ridge, at 2*d.*	1	6	0
	13	cube	..	Oak in posts to sheds, at 5*s.*	3	5	0
	76	run	..	1½ deal manger and supports, at 1*s.*	3	16	0
			6	Windows complete, painted as before, at 26*s.*	7	16	0
			8	1 in. ledged feeding-doors, and painting, at 4*s.* 6*d.*	1	16	0
	228	sup.	..	2½ in. framed, ledged, and braced doors, and painting, at 1*s.* 10½*d.*..	21	7	6
	60	..	..	2 in. ditto ditto, and painting, at 1*s.* 9*d.*	5	5	0
	126	..	..	1 in. ledged and braced, and painting, at 1*s.* 1*d.*..	6	16	6
	21	run	..	Chamfered capping, and ditto, at 2*d.*	0	3	6
	110	..	..	5 by 4 rebated door frames, and ditto, at 9½*d.*	4	7	1
	13	..	..	18 by 1¼ shelves and bearers, at 1*s.*	0	13	0
			4	Oak posts to yard-doors, at 1*l.* ..	4	0	0
				Carried forward .. .. £	107	12	1

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Brought forward	107	12	1
			14	Pairs hinges and hooks, and painting, at 6*s.*	4	4	0
			8	Pairs small ditto, to feeding-doors, at 2*s.* 6*d.*..	1	0	0
			3	Strong bolts to large double doors, at 2*s.* 6*d.*..	0	7	6
			1	8 in. stock lock to shepherd's store ..	0	2	0
			19	Latches, average each 2*s.* 6*d.*	2	7	6
				Carried to Summary	£115	13	1
				IRONFOUNDER AND PLUMBER.			
104	run	..	..	4 in. cast-iron gutter as before, including down-pipes, &c., and painting, at 1*s.* 9*d.*	9	2	0
			2	Cast-iron water-troughs, as before, at 2*l.* 10*s.*..	5	0	0
			1	Do. iron corner hay-rack	0	8	0
30	run	..	..	1 in. galvanized-iron water-supply, at 2*s.*	3	0	0
			2	Ball-cocks, at 7*s.* 6*d.*..	0	15	0
			11	King pins to principals, at 2*s.* 6*d.* ..	1	7	6
				Carried to Summary	£19	12	6
				SUMMARY (PART 2).			
				Excavator, bricklayer, and slater ..	241	17	9
				Carpenter and joiner	115	13	1
				Ironfounder and plumber..	19	12	6
				Total	£377	3	4
				(The painting work is included in the various carpenter's and ironfounder's prices.)			
				Summary of Part 1, brought forward from page 811	3716	3	9
				Summary of Part 2, as above	377	3	4
				Total Estimate as per Ground Plan	£4093	7	1
				(MEM.—If the yards were covered with corrugated iron, a saving of about 130*l.* would be effected, also if "pitching" with paving stones was substituted for some of the floors instead of concrete, a further considerable reduction might be made in the Estimates.)			

"The Eye of the Master is necessary to the due Economy of Labour."

Description by the Author.

Farm buildings having been a well-studied subject with us for the last twenty years, we have lost no opportunity of inspecting anything out of the common, and the result of that experience has been the confirmation of our views, viz. that the best form of erection is that of three sides of two squares, placed to form a rectangle, making a double range in the centre, with the barn running out of the square or rectangle into the rick-yard.

We may, before going further, enter into the object to be attained by farm buildings, and in doing so, venture to assert that considerable vagueness of idea exists on this point, and we therefore give, as our opinion, what that object is, viz. the conversion of the hay, straw, and roots, into meat or manure, with the lowest possible expense on the one hand, and the greatest economy of worth consistent with health, so as to produce the greatest result from the food on the other, combining this with the greatest facility for the master's supervision.

Here, however, another point arises, viz. the cost; and our invariable rule is that if a tenant cannot afford to pay 5 per cent. interest on the outlay, it is not a profitable investment for the landlord; but if one tenant keeps 50 Shorthorns, worth 100 guineas each, he can afford very different buildings to another tenant with 100 head of young cross-breed stock worth, say, 10*l.* each.

The high price of meat during the last five years has brought in, however, another element, and one of necessary importance. Meat at 9*d.* or 10*d.* per pound pays for the consumption of a large quantity of cake and corn, which was not the case when meat was at 6*d.* or 7*d.*; and if a farmer uses much cake, he finds he can afford to protect his manure by covered yards, and have the increasing tendency in this direction. It is from a want of sufficiently studying these points so many conflicting opinions arise, and the want of a thorough practical man in designing farm buildings shows itself, for hundreds of pounds may easily be thrown away.

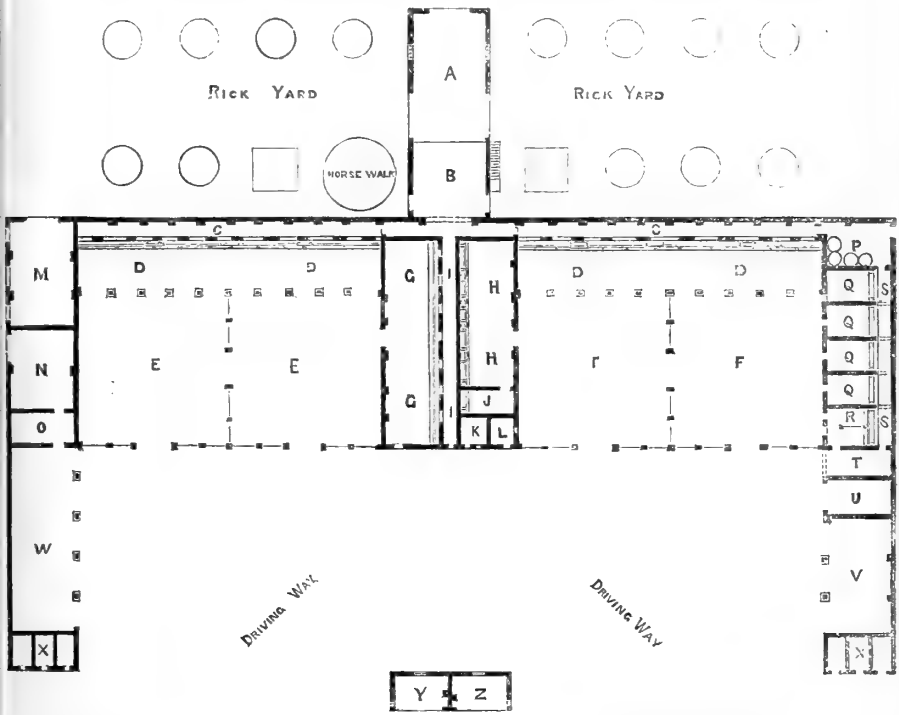
In the accompanying plan we carry out these views, and we submit that a modification of this plan must be adopted on arable farms, if we are right in the three principles we have laid down, viz., economy of labour, worth and health, and facility of supervision by the master's eye.

Our plan is designed for 150 acres of heavy arable land that will not carry sheep, to which there would possibly be 40 or 50 acres of pasture land attached, and would accommodate 70 to 80 herd of cattle of various ages, 14 or 15 horses, and 30 to 40 pigs; which is more stock than would generally be kept on 200 acres.

Chaff-Cutting and Pulping-House.—The first consideration is the chaff-cutting and pulping-house, which is situated as near as possible to the centre of the buildings, and is thus within 60 feet of the straw in barn, hay in the ricks, roots in the heaps, and most of the stock to be fed. It would form one end of the barn, the chaff being cut in a loft. One man, who may sometimes require the help of a boy, will thus be able to provide the food and feed all the stock.

The Barn.—We take the barn next, as we claim a novelty here. To properly economise labour, the barn must be out of the square, and in these days of portable steam threshing-machines, a farmer wants a barn for something more than putting corn in; he only saves 10*s.* or 12*s.* by putting a rick in the barn instead of the rick-yard. We therefore purpose the barn first to drive 3 or 4 loads of hay or corn in during a catching time, and then keep it for

Fig. 10.—*Plan of Farm Buildings*—"*The Eye of the Master is necessary to the due Economy of Labour.*"



A. Barn.
B. Pulping-house.
C. Feeding gangway.
D. Shed for young stock.
E. Foldyard for young cattle.
F. Foldyard for young cattle and cows.
G. Stable for 12 horses.
H. Cow-house for 10 cows.
I. Feeding-gangway.
J. Calves-pen.
K. Office.
L. Men's room.
M. Granary and store-room.
N. Lock-up implement house.
O. Carpenter's shop and castings.
P. Food for pigs.
Q. Piggeries.
R. Nag-stable.
S. Feeding-gangway.
T. Gangway.
U. Gig-house.
V. Implement shed.
W. Carts, implements, &c.
X. Poultry cots.
Y. Kitchens.
Z. Sitting-room.

storing straw in; when threshing for this purpose, it will be seen we provide three sets of barn-doors instead of two, and the corn ricks should be so made that by fixing a straw elevator, and opening the upper half of the barn doors, the straw would be passed in over the lower half, and be thus put in the dry with the least possible cost. The other end of the barn should always have a loft or floor in; this, if wished, may be filled with corn at harvest, and used for chaff-cutting, &c., afterwards.

Bedding and Littering Arrangement.—This has caused us a good deal of consideration. If the straw is carried it creates great untidyness; and if hauled, is a great expense, as it involves two men besides horse and cart. We claim a novelty here, by putting in Queen's posts instead of King's posts. We are enabled to get a passage in the roof over the gangway, if a double shed, and the straw is passed along this passage to any part required, and the interest on the outlay for such passage would soon be spent in hauling, and as it would communicate with the chaff-loft and barn, it may also be made available for other purposes. We claim this as a novelty, never having seen it in operation.

Carthorse Stable.—Horses are a serious item on a farm, and as they require attention summer as well as winter, it is of importance they should be well placed to be served with food easily, and at the same time have proper supervision. We therefore prefer the centre range, and if the feeding at their heads from a range is objected to, the common way may be easily adopted. It also has the advantage of being near the house, and is convenient for the master giving his orders, and for the implement shed, and at the same time for the manure to be properly mixed with that of other stocks.

Cow-House.—We place the cow-house on the opposite side of the range to the stable, as, next to the horses, the milk or breeding cows eat the most food, and should therefore be nearest to the chaff-house, and also convenient to the house, for the milk to be taken in and the calves attended to. We have placed the cows in pairs; but there is no necessity for this, they can run on continuously. We must not here omit to mention the watering arrangements, for wherever chaff is used pipes are always getting choked. We therefore convey the water in spouts, so that the stockman can clean them out with a wisp of straw, and they can be used in frosty weather. The mangers for cattle should be as near the ground as possible, and be swept or brushed out at least twice a-day.

Sheds for Young Stock.—These run to the right and left of the chaff and pulping-house, and these not only get the advantage of being easily fed, but a full south shed, a very great advantage for young growing animals.

Covered Yards.—Any of the yards can be covered at the cost of about 8*d.* or 9*d.* per foot super.; and if not done now, we should recommend buildings being so constructed that they can be put up at a future time, if required.

Implements.—These should be as near as possible to the cart stable, so that as little time as possible is lost by men and horses getting away to work.

Piggeries and other Buildings.—These speak for themselves, and can be easily altered to suit the requirements of the farm and the farmer.

Building Materials.—It is impossible to do more than make a few remarks under this head, as the prices vary more than one-half. On many estates stones can be had for the raising, and on the spot; while on others bricks may also be made for about 20s. per 1000; while on others they may cost over 30s., and 10s. more for the hauling. Again, if slates are used, they must be boarded under, where stock is kept, which makes them very expensive. Broseley tiles are favourites, as they are as cheap as slates, and many people prefer their look of neatness. We, however, prefer the triple Roman or Bridgewater tiles, as they have several advantages, viz., cost only half the

money; if one gets broken any labourer can replace it; they are very porous, and consequently more healthy for stock; and if their red appearance is objected to, they can be had glazed or coloured at a very little extra cost.

The House.—The house should in all cases be on the south side of the farm buildings, to admit of a view being obtained in case of anything being amiss; and whatever the other arrangement of the house may be, the sitting-room should be at the north-west corner, and the kitchen at the north-east, as it is these rooms, and the sleeping-rooms over, that will be principally occupied by the master and servants, and therefore more supervision obtained. The cost of the house will probably be 2*l.* per acre, according to the size of the farm.

The Site.—Before concluding our remarks we ought to add a word or two about the site, as there are several points that must be kept in view, and upon which it is necessary for the practical mind to be exercised. The homestead should be as near as possible to a good public road, where good water can be had for a water power, if possible, with a porous subsoil naturally, or made so artificially, for neither the farmer's family nor his stock will thrive on a wet fusty or boggy soil; and lastly, as nearly as possible at the junction of the arable and pasture land, for the cattle not to have far to travel on the one hand, or the horses on the other, for as farm-horses only travel about 2 miles per hour, 12 horses and 6 men, at 4*d.* per hour, cost the farmer 6*s.* every day doing nothing, if they have to go half a mile to work and come home once in the day.

Bill of Quantities and Detailed Estimate.

Yards.	Feet.	Inches.	No.		£	*s.*	*d.*
158	cube	..	..	Digging to trenches, pit filled in and rammed, at 9*d.*	5	18	6
14	..	..	..	Concrete in foundations, at 6*s.* ..	4	4	0
				Provision for drainage	10	0	0
1912	sup.	..	..	Reduced 9 in. brickwork in mortar, at 5*s.*	478	0	0
245	..	..	..	Hard common brick flat floor in mortar, on a bed of ashes, at 2*s.* 3*d.*	27	11	3
14	..	..	..	Brick on edge floor in mortar, on a bed of ashes, at 3*s.* 6*d.*	2	9	0
180	..	..	..	Floor composed of 6 in. concrete, levelled and floated to a fair face and finished with a coating of tar composition, $\frac{3}{4}$ in. thick, at 1*s.* 6*d.*	13	10	0
102	..	..	..	Floor composed of 6 in. concrete, levelled and floated to a fair face and finished with a coating of asphalte, $\frac{1}{2}$ in. thick, at 3*s.* 9*d.* ..	19	2	6
75	..	..	..	4 in. forest stone floor on a hard, well rammed and level bed, at 4*s.* 6*d.*	16	17	6
	206	run	..	Extra to half-round blue-brick curb in cement, at 2*d.*	1	14	4
	206	..	..	Extra to forming chase, 3 by $1\frac{1}{2}$ in. 1 brick wall, at 1*d.*	0	17	2
	206	..	..	Cattle trough (cisterns measured in) formed of 1 brick low wall with blue-brick curb in cement, the bottom and sloping side in quarries and fitted with large iron staples and rings, at 2*s.*	20	12	0
				Carried forward .. .. £	600	16	3

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Brought forward	600	16	3
	54	..	..	Stable manger similarly built, but without cisterns, and being higher the troughs is supported on brick arches, at 2*s.* 6*d.*	6	15	0
			10	Extra to 2 in. stone cisterns, 2 ft. 3 in. by 1 ft. 9 in. by 12 in. deep, at 5*s.*	2	10	0
			3	Extra to 2 in. stone cisterns, smaller, 2 ft. 3 in. by 1 ft. 9 in. by 12 ft. deep, at 3*s.* 6*d.*	0	10	6
			31	Extra to axed arches, to external openings, at 1*s.*	1	11	0
			9	Extra to relieving arches, at 9*d.* ..	0	6	9
			26	Extra to blue-brick on edge cells, set in cement, at 1*s.*	1	6	0
			2	Extra to forming windows in brick-work, at 5*s.*	0	10	0
			50	Cast-iron air-bricks, to be used when directed, at 3*d.*	0	12	6
			24	Base stones, 12 by 12 by 12, sunk and chamfered for posts, at 2*s.* 6*d.*	3	0	0
			1	Flight of stone steps to two-story building	4	0	0
Square.							
131½	sup.	..	..	Triple Roman tiles on strong fir laths, at 20*s.*	131	10	0
15½	..	..	..	Triple Roman tiles, glazed and torched underside, with hair mortar, at 25*s.*	19	7	6
			128	Extra to glass tiles, at 1*s.*	6	8	0
	1510	cube	..	Fir in roof-timbers, at 2*s.* 2*d.*	163	11	8
	336	..	..	Fire in joists, plates, &c., at 2*s.* ..	33	12	0
	516	run	..	7 by 1 ridge piece, at 2*d.*	4	6	0
	60	..	..	Herring-bone strutting joists measured in, at 3*d.*	0	15	0
19½	sup.	..	..	1 in. rough deal floor, at 20*s.*	19	10	0
4¼	..	..	..	1¼ in. rough deal floor, at 25*s.* ..	5	6	3
	570	run	..	Rail and balusters side of gangway, at 4*d.*	9	10	0
	180	run	..	Post and rail-fencing to yards, at 1*s.*	9	0	0
			6	Foldyard-gates complete, at 30*s.* ..	9	0	0
			24	Stop chamfered roof-posts, at 12*s.* 6*d.*	15	0	0
			18	Stall-posts, at 5*s.*	4	10	0
			6	1¼ in. tongued and grooved sliding doors, 3 ft. 3 in. by 3 ft., with top and bottom rails, at 10*s.*	3	0	0
			16	1 in. ledged and braced doors, average 6 ft. 6 in. by 3 ft., with all proper hinges and fastenings, at 20*s.*	16	0	0
			5	1 in. ledged and braced doors, average 3 ft. 6 in. by 3 ft., with all proper hinges and fastenings, at 10*s.*	2	10	0
				Carried forward .. .. .. £	1074	14	5

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Brought forward	1074	14	5
			3	1¼ in. ledged and braced doors, 6·6 by 4·0, in two heights, hung with strong bands to posts on hook stones, including fastenings, complete, at 30*s*.	4	10	0
			2	1¼ in. ledged and braced doors, 7 ft. by 7 ft., hung folding in two heights, hung with strong bands to posts or hook stones, including fastenings complete, at 50*s*.	5	0	0
			2	1¾ head butt sliding doors 6 ft. 6 in. by 4 ft., with axle-wheels and wrought-iron runners, strong flush ring and proper fastening, at 40*s*.	4	0	0
			1	2½ in. gighouse-door, 10 ft. by 8 ft., framed, ledged, and braced, filled in with 1¼ ploughed and tongued boarding, hung folding on strong bands to stones or posts, and fitted with proper bolts	6	0	0
			3	3 in. barn-doors, 10 ft. by 8 ft., framed, ledged, and braced, filled in with 1¼ ploughed and tongued boarding, but in 2 heights, hung folding on strong bands to stones or posts, and fitted with proper bolts, at 10*l*. each	30	0	0
				Extra to hanging wicket-gate on ditto	0	10	0
			1	Pulley-block and wheel	0	10	0
			4	1 in. ledged and braced swinging flaps, 8 ft. by 3 ft., hung to 5 by 4 head with hook-and-eye fastenings to 4 by 4 sill, at 24*s*.	4	16	0
			4	Pig troughs, 8 ft. long, at 10*s*. ..	2	0	0
			..	Provide for fittings to nag stable ..	5	0	0
	1004	run	..	4½ in. O. G. iron, or zinc eaves-gutter, at 5*d*.	20	18	4
	160	..	..	3 in. iron down-pipe, at 5*d*.	3	6	8
				No. 14 extra to heads and shoes, at 1*s*.	0	14	0
	216	run	..	3 in. half-round iron spouting, at 4*d*.	3	12	0
			5	Cast-iron windows, at 7*s*. 6*d*.	1	17	6
				Provide for other water supply ..	10	0	0
				Total .. .. £	1177	8	11
				Add, if half the yards are covered ..	100	0	0
				Total .. .. £	1277	8	11

"Utility."

Description by the Author.

The Plans, No. 18 Motto, "Utility,"—by W. J. Moscrop and W. J. Moscrop, Jun., Olliver, Richmond, Yorkshire, are designed for a farm of 600 acres, 100 acres pasture and 500 acres arable; and for the accommodation of 100 head of cattle, on a farm where 30 calves are supposed to be reared annually, and a like number of fat cattle finished off in the boxes.

There is a cow-house for 10 cows (1 cow to rear 3 calves). Next, 9 boxes for the calves while young; and 6 yards of 1050 feet superficial each, in which to lodge 40 head of young cattle, ages varying from 6 to 18 months, when taken up in November; and boxes to fatten off 30 head of cattle at from 30 to 36 months old.

The latter would commence to go off about the beginning of the year, and so make room for the larger calves, after weaning.

There is also a roomy box for a bull, and a hospital at an extreme corner of the buildings for sick animals.

Stable accommodation is provided for 12 cart-horses in boxes, with food-store in centre, and 3 boxes for young horses, &c. There are also 2 stalls and 1 box, harness-room, &c., for the saddle and harness horses.

Pigsties to accommodate from 25 to 40 pigs, and houses for 100 head of poultry, with boiling-house adjacent to both.

The necessary shedding for carts and implements is also provided, which, together with smith's and carpenter's shop, is quite contiguous to the stables, and enclosed as a yard.

The authors hold that for a farm of this extent, in the absence of water-power, fixed machinery is in every way preferable to portable, and a fixed engine, as will be seen, is placed at the east end of the buildings.

Adjoining, on the ground-floor, are the corn and straw barns, cut-chaff room, and turnip-house. Above are sheaf-barn, mill-room, and store, in which grinding-mill, cake-crusher, &c., are placed. The cake and meal, when crushed and ground, fall into bins, and are from thence delivered by a shoot to the mixing-room below.

The chaff-cutter is placed on a stage, and the straw is carried by a web direct from the threshing-machine, so that as much as requisite is cut, as threshed, and delivered by a shoot to the chaff-room below; the remainder of the straw being deposited in the straw-barn.

The root-house and chaff-room adjoin, and afford every facility for mixing; meal and crushed cake also being delivered here.

The granaries have direct communication with the barns, and the corn from the finishing machine is delivered there (if required) by hoist. From the granary the corn is delivered to carts, by a trap-door in the floor, to the arch-way underneath.

Corn for saddle-horses is delivered to the stable by a shoot from the granary.

Feeding-boxes, as requiring most food, are placed nearest the food-stores and straw-barn; while the stable, which requires few or no roots, is placed furthest from it, but yet within a very convenient distance.

The central gangway commands the whole building, and, with a tramway laid to the food-stores, the whole of the cattle can be led with great despatch and economy, and all under cover.

The boxes are so arranged and constructed that the manure from them may be filled direct to the carts, and twice handling is not required. The access to the yards will also be seen to be all that a practical farmer can desire.

The manure from the cows and horses is thrown together into one yard, the utility of which by practical men is well understood.

Drainage from the boxes and covered yards is not required; but from the stables, cow-house, and open yard it is carried into tanks and on to the land by gravitation.

The rain-water is carried to a tank near the engine, and, in the absence of spring-water, it could be utilised for the stock in the yards, &c.

Ventilation throughout is attained by inlets from the walls near the eaves (Musgrave's patent being specified), and outlets by louvres in the roof.

One-half of the yards are shown covered, and the others are the ordinary shed and open yards; but the whole could be covered, or, *vice versâ*, contracted or enlarged, without in any way infringing on the principle of the design or destroying "Utility."

Bill of Quantities and Detailed Estimate.

Excavator, Mason, and Bricklayer.			s.	d.	£	s.	d.
Excavation to foundation trenches, tank, drains, and yard surfaces	790	yards cube, @	0	8	26	6	8
Filling-in to trenches, &c.	310	„ „	0	6	7	15	0
Puddled clay to tank					0	15	0
9 in. glazed drain-pipe	50	yards run „	1	3	3	2	6
6 in. „	138	„ „	1	0	6	18	0
4 in. „ (soft water)	170	„ „	0	8	5	13	4
21 in. by 21 ft. by 6 in. sink stones, trap and grating	32	„ „	7	6	12	0	0
Brick walling 3 ft. 3 in. thick (Chy. top)	16	yards sup. „	14	6	11	18	0
„ 1 ft. 10½ in. ditto	10	„ „	8	9	4	7	6
„ 1 ft. 6 in. ditto	412	„ „	7	0	114	4	0
„ 1 ft. 1½ in. ditto	690	„ „	5	9	197	7	6
„ 0 ft. 9 in. ditto	2736	„ „	4	1	558	12	0
Labour, forming arches, &c. (extra)	1706	feet run „	0	2	14	4	4
„ flues	100	„ „	0	2	0	16	8
Fire-brick lining to chimney, 4½ in. thick	11	yards sup. „	2	0	1	2	0
Brick coping set in cement	54	feet run „	0	3	0	13	6
Centres for arches say					5	0	0
Running crooks with lead					5	0	0
Set pots and fixing with coping, &c.	2	„ „	50	0	5	0	0
Blacksmiths forge complete	1	„ „			3	0	0
Saddleroom range and setting					2	0	0
Mason. 10 in. by 4 in. thresholds	212	feet run „	1	6	15	18	0
9 in. by 2 in. flag coping	248	„ „	1	0	12	8	0
12 in. by 4 in. stone coping	240	„ „	2	0	24	0	0
Saddle stones	13	„ „	7	0	4	11	0
Foot stones 18 in. by 9 in. by 12.	26	„ „	4	0	5	4	0
8 in. by 8 in. by 8 in. stones to gangway	32	„ „	1	0	1	12	0
10 in. by 6 in. jambs and mantel	14	„ „	1	6	1	1	0
2 in. rough flagging, clamped with iron	50	yards sp. „	2	0	5	0	0
Cement floor, 2 in. thick	205	„ „	3	0	30	15	0
„ 1½ in. „	770	„ „	2	2	83	8	4
Cement hearth and brick hearth	6	feet sp. „	0	6	0	3	0
Cement pointing and plastering to tank	20	yards sp. „	1	6	1	10	0
Cobble paving in ashes	1276	„ „	1	0	63	16	0
Cutting grooves, chases, &c.					5	0	0
Contingencies					10	0	0
					£ 1250	2	4

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

CARPENTER AND JOINER.			s.	d.	£	s.	d.
Undressed lintel, 4 in. thick	64	feet sup.	@ 0	6	1	12	0
3¼ in. by 2½ in. undressed spars	64½	squares	„ 5	6	16	2	9
2½ in. by 2¼ in. „	164	„	„ 4	3	34	17	0
12 in. by 4 in. framed, undressed to principals	910	feet run	„ 0	8	30	6	8
7 in. by 2½ in. ditto ditto	1564	„	„ 0	3½	22	16	2
9 in. by 3 in. ditto ditto	2371	„	„ 0	4½	44	9	1
4 in. by 2¼ in. wall plate	1595	„	„ 0	2	13	5	10
6½ in. by 2½ in. pad	154	„	„ 0	2	1	5	8
9 in. by 1½ in. ridge	130	„	„ 0	2	1	1	8
7 in. by 1¼ in. ditto	836	„	„ 0	1¼	4	7	1
7 in. by 2½ in. strutts	728	„	„ 0	2½	7	10	8
5½ in. by 3 in. ditto	745	„	„ 0	3	9	6	3
6 in. by 4 in. purlins	2864	„	„ 0	3½	41	15	4
7 in. by 2½ in. hip and valley rafters	215	„	„ 0	2½	2	4	9
4½ in. by 3 in. joisting to gutter	1½	square	„ 12	0	0	18	0
1 in. undressed boarding and bearers	18	yards sp.	„ 1	4	1	4	0
2 in. by 1½ in. rolls for lead	36	feet run	„ 0	1	0	3	0
12 in. by 9 in. by 10 in. cesspool, 1¼ in. thick, with outlet	2	„	„ 1	6	0	3	0
8 cwt. of wrought iron in straps, bolts, rods, &c., including painting and fixing	8	cwt.	„ 33	0	13	4	0
9 in. by 3 in. joists	54	squares	„ 23	0	62	2	0
5½ in. by 3 in. „	7	„	„ 15	0	5	5	0
4½ in. by 1½ in. wall plate	520	feet run	„ 0	1	2	3	4
1¼ in. F. and G. boarding to granaries	615	yards sp.	„ 1	6	46	2	6
1 in. rough boarding to poultry house	36	„	„ 1	4	2	8	0
6 in. by 6 in. oak post to gallery	12	ft.	„ 2	6	1	10	0
Ventilators to roof	14	„	„ 53	0	37	2	0
4½ in. by 3 in. rebated frame with 1¾ in. sash	708	„	„ 0	8	23	12	0
„ „	1082	„	„ 0	3½	15	15	7
2 in. F. and G. clead doors	1388	ft. sp.	„ 1	9	121	9	0
1½ in. „	1050	„	„ 1	2	61	5	0
4 field gates and fixing with posts	4	„	„ 25	0	5	0	0
Fencing to box divisions	245	yards run	„ 2	3	27	11	3
Musgraves fittings for 10 cows	10	„	„ 55	0	27	10	0
„ ventilators to walls	20	„	„ 4	6	4	10	0
„ stable fittings to nag stable	Stalls £4 10 0 Box 2 5 0 Manger 4 0 0				10	15	0
9 in. by 3 in. string to staircase	64	ft. run	„ 0	6	1	12	0
1½ in. tread	78	feet sup.	„ 0	8	0	19	6
3 in. by 2 in. handrail	16	„	„ 0	9	0	12	0
Newel posts	4	„	„ 3	0	0	12	0
5 in. by 5 in. oak hind-post to stable division	50	feet	„ 0	6	2	10	0
5 in. by 3½ in. oak head-post to stable division	60	„	„ 0	6	3	0	0
4¼ in. by 3¼ in. tops and bottom rails	180	„	„ 0	4	3	0	0
1½ in. stall division	440	feet sup.	„ 1	0	22	0	0
Mangers and feeding troughs	375	„	„ 1	6	28	2	6
4½ in. by 3 in. oak plate in cement	840	feet	„ 0	6	21	0	0
½ in. iron plate fixed to same	840	„	„ 0	6	21	0	0
36 sets of rollers for sliding doors	36	„	„ 3	0	5	8	0
	Carried forward			£	810	9	7

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued*.

		s.	d.	£	s.	d.
	Brought forward ..			810	9	7
10 sets gearing for opening sashes ..	10 feet @	3	0	1	10	0
24 in. smith made T-band hinges ..	18 pr. „	2	0	1	16	0
18 in. „ „ ..	57 „ „	1	6	4	5	6
14 in. „ „ ..	15 „ „	1	0	0	15	0
9 in. metal barrel bolts	75 „ „	0	9	2	16	3
6 in. „	12 „ „	0	6	0	6	0
Hasps and staples	30 „ „	0	9	1	2	6
Norfolk latches	25 „ „	2	0	2	10	0
Snecks and handles	20 „ „	1	6	1	10	0
12 in. stock locks	12 „ „	5	0	3	0	0
Fitting up poultry houses .. .. say	.. .. ..			5	0	0
Sundries	.. .. ..			15	0	0
	Carried to Summary .. £			850	0	10
SLATER.						
Slating, as per specification	3072 yards sp. @	3	0	460	16	0
Eaves	542 „	1	0	27	2	0
Cutting to valleys, &c.	90 „	1	0	4	10	0
Ridge and hip	784 „	1	0	39	4	0
Rough plate glass	25 piece	2	6	3	2	6
Slating in underflashings	.. .. ..			2	0	0
	Carried to Summary .. £			536	14	6
PLUMBER.						
Milled lead to gutters, flashings, &c. ..	20 cwt. 3 qrs. @	28	0	29	1	0
6 in. ½-round eaves spouting	45 yards run „	2	6	5	12	6
4 in. „ „	359 „ „	2	3	40	7	9
3 in. down-pipes	133 yards „	1	9	11	5	3
	Carried to Summary ..			£86	6	6
PAINTER AND GLAZIER.						
4 coats oil-paint to woodwork	972 yards @	0	7	26	7	0
3 „ „ ironwork	150 „ „	0	4	2	10	0
Glazing with 15 oz. sheet glass	333 feet sp. „	0	7	9	14	3
	Carried to Summary ..			£38	11	3

SUMMARY.

	£	s.	d.
Mason, bricklayer, &c.	1250	2	4
Carpenter and joiner	850	0	10
Slater	536	14	6
Plumber	86	6	6
Painter and glazier	38	11	3
Whitewashing, 3 coats	25	0	0
Total	£2786	15	5

"Per Mare per Terram."

Description by the Author.

The drawings, &c., to which this description and estimate refers, are for a farm of about 300 acres; 200 being arable, the remainder grass.

The chief objects endeavoured to be arrived at are economy of labour in the care and feeding of stock, combined with as small an outlay as possible in the construction of the buildings.

Nothing novel can be claimed in the arrangement or construction of the buildings, as they are not intended for a model farm where more elaborate details would be gone into, but are intended to try and represent a class of buildings a landlord could put up, with a few alterations, to adapt them to any particular situation. Fault will no doubt be found in horse-gear being proposed, and not a portable engine, but that is one of the above alterations, as an engine-house might very easily be built on to the barn. The idea in not providing for a portable engine is that an extra horse on such a farm as that for which accommodation is here provided would be more economical.

The horse-gear is intended to cut chaff, pulp roots, and pump water; a 300-gallon tank being provided in a drop loft, which supplies a 20-gallon tank placed below in the passage of the barn, the latter being on a level and connected with a water trough in the covered yard. A pipe also leads from the large cistern to a boiler, along the feeding-passage, with branch pipes to every other stall, fitted with taps. The rainwater-tank is capable of holding over 5000 gallons. The barn is calculated as tiled in the specification; but the difference if slated with best Bangor slates, taking into consideration the smaller scantlings, would be 26*l.* 2*s.* 6*d.* An estimate for two Dutch barns, capable of holding 80 to 95 tons of straw each, are given, the straw-barn being small.

Bill of Quantities and Detailed Estimate.

Yards.	Feet.	Inches.	No.	Excavator.	£	*s.*	*d.*
218	cube	..	..	Dig, part fill-in and ram-to foundations, at 6*d.*	5	9	0
64	cube	..	..	Dig, part fill-in and ram-to tank, at 8*d.*	2	2	8
77½	cube	..	..	Concrete, rubble 6 parts, lime 2 parts, to foundations, at 6*s.* 6*d.*	25	3	9
16	cube	..	..	Rubble filling-in to mangers, at 4*s.* 6*d.*	3	12	0
122½	sup.	..	..	Concrete, 4 in. thick, for floors, 3 parts gravel, 1 part cement, at 2*s.* 6*d.*	15	6	3
302	sup.	..	..	Concrete, 4 in. under Stafford bricks, at 2*s.*	15	4	0
17	sup.	..	..	Concrete 4 in. under floor of tank, at 2*s.*	1	14	0
246	sup.	..	..	Marl and cinder-ash floors, 4 in. thick, 3 parts marl, 2 parts cinder-ash, at 1*s.* 4*d.*	16	8	0
				Carried forward	£84	19	8

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Brought forward	84	19	8
				DRAINS.			
69	run	..	..	6 in. glazed stoneware socketed pipes, jointed in clay, average depth 1 ft. 9 in., at 2*s*...	6	18	0
			9	Extra to 6 in. bends, at 2*s*. 6*d*. ..	1	2	6
			29	„ junctions, single, at 3*s*.	4	7	0
			9	„ connections to stack-pipes, at 2*s*. 9*d*.	1	4	9
			1	6 in. connection to trap, at 4*s*... ..	0	4	0
			3	Ends of drains made good to tank, at 2*s*. 6*d*...	0	7	6
18	run	..	..	18 in. glazed earthenware half-round pipes for mangers, at 4*s*. 6*d*.	4	1	0
23	run	..	..	15 in. glazed earthenware half-round pipes for mangers, at 3*s*. 6*d*.	4	0	6
			1	Iron trap for hospital, at 7*s*. 6*d*. ..	0	7	6
				Carried to Summary	£107	12	5
				BRICKLAYER.			
Rods. 39½	sup.	..	..	Reduced brickwork in mortar, at 9*l*. 5*s*.	365	7	6
1½	sup.	..	..	Reduced brickwork in cement, at 12*l*. 15*s*.	19	2	6
	163	sup.	..	Damp course of pitch, tar, and quick-lime, at 2*d*.	1	7	2
Yards. 58½	sup.	..	..	Portland cement rendering, ⅞ in. thick, to tank, at 5*d*.	1	4	4½
302	sup.	..	..	Stafford-brick paving in cement, at 3*s*. 6*d*.	51	16	0
17	sup.	..	..	Brick flat paving to floor of tank, at 2*s*.	1	14	0
	377	..	..	Rough cutting, at 1½*d*.	2	7	1½
	85	..	..	Fair cutting to facings, at 2*d*... ..	0	14	2
	76	..	..	„ „ circular, at 2*d*.	0	12	8
183	..	..	..	Twice white walls, at 2*d*.	1	10	6
	442	run	..	Cement filleting, at 2*d*.	3	13	8
	84	run	..	Cutting to Stafford paving, at 3*d*. ..	1	1	0
	198	run	..	Extra to guttering in stable and cow-house, at 10*d*...	8	5	0
	113	run	..	Brick on edge window-sills in cement, at 4*d*.	1	17	8
	503	run	..	Labour only to over railing course, at ¾*d*.	1	11	5¼
	13½	run	..	Cutting to groin in tank	0	6	9
	3½	run	..	Cut and fine stone landing	0	3	6
			34	Bed and point window frames, at 4*d*.	0	11	4
			2	Flues cored and pargeted	1	16	0
			1	Set copper, with all furnace work, complete	0	14	0
			1	Extra labour, forming manhole to tank..	0	3	6
				Carried forward .. .. £	465	19	10¼

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Brought forward	465	19	10¼
			18	Extra to rough arches, 14 in. soffit, average opening 3 ft. 9 in., at 1s.	0	18	0
			1	Extra to rough arches, 14 in. soffit, 11 ft. opening..	0	4	0.
			33	Extra to rough arches, 9 in. soffit, average opening 3 ft 6 in., at 9d.	1	4	9
			2	Extra to rough arches, 9 in. soffit, 9 in. 6 in. opening, at 3s. 6d... ..	0	7	0
			12	Ends, cut and pinned, at 1s.	0	12	0
				Allow for cutting chases for pipes as required	0	6	0
				Carried to Summary	£469	11	7¼
				TILER.			
Squares.							
106½	sup.	..	..	Red pantiles, pointed and splices, at 1l.	106	10	0
87½	sup.	..	..	Red pantiles, laid dry and splices, at 15s. 3d.	66	14	3
	637	run	..	Ridge tile and pointing, at 6½d. ..	6	0	8
				Carried to Summary	£179	4	11
				MASON.			
	11½	sup.	..	3½ in. tooled landing, York stone, at 10d.	0	9	7
	32½	sup.	..	2½ in. tooled steps, York stone, at 6d.	0	16	3
	99½	sup.	..	3½ in. „ door sills „ at 11d.	4	11	1½
	21½	sup.	..	4 in. „ „ „ at 1s.	1	1	6
			1	Tooled stone for manhole, 2 ft. by 2 ft.	0	4	6
			10	Tooled stone for ports, 9 ft. by 9 ft. by 6 in., with bevelled edge and morticed, at 2s. 6d.	1	5	0
			4	Tooled stone for gates, 9 in. by 9 in. by 15 in., with iron catch let in and run with lead, at 5s.	1	0	0
			16	Tooled stone bases for columns, 18 in. by 18 in. by 18 in., bevelled and morticed, at 12s. 6d.	10	0	0
			1	Plain stone chimney-piece for 16 in. opening, at 5s. 6d...	0	5	6
				Carried to Summary	£19	13	5½
				CARPENTER.			
	16,192	run	..	3 by 2½ rough fir in rafters, at 1d...	67	9	4
	875½	run	..	4½ by 3 rough fir in pole and wall-plates, at 1½d.	5	9	5¼
	16	run	..	4½ by 4 rough fir in pillars of root-house, at 1¾d...	0	2	8
	32	run	..	9 by 1½ rough fir in valley rafters, at 1½d.	0	4	0
				Carried forward	£73	5	5¼

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Brought forward ..	73	5	5
	647¾	run	..	7 by 1¼ rough fir in ridge, at 1¼*d.* ..	3	7	6
	272	run	..	6 by 3 rough fir in wall-plates, at 2*d.*	2	5	4
	36	run	..	6 by 4 rough fir in templates, at 2½*d.*	0	7	6
	813¾	run	..	7 by 3 rough fir in joists, at 2¼*d.* ..	4	4	9½
	1900	run	..	8 by 3 rough fir in purlins, at 2½*d.*	18	15	10
	206	run	..	9 by 3 rough fir in wall-plates, at 2¾*d.*	2	7	3
	190½	run	..	9 by 4 rough fir in wall-plates, at 3½*d.*	2	15	6¾
				Fir framed in Roofs.			
	481	run	..	4½ by 3 rough fir in struts, at 1½*d.*..	3	0	2
	66	run	..	7 by 3 rough fir in collar ties, at 2¼*d.*	0	13	9
	331½	run	..	7 by 4 rough fir in tie beams, at 3*d.*	4	2	10½
	1664	run	..	9 by 3 rough fir in principals and collar ties, at 2¾*d.*..	19	1	4
	127½	run	..	9 by 4 rough fir in tie beams, at 3½*d.*	1	17	9
	108	run	..	9 by 9 rough fir in beams, at 9*d.* ..	4	1	0
	26	run	..	7 by 3 rough fir in beams, bolted together, at 2¼*d.*	0	4	10½
	20	run	..	7 by 3½ oak templates, at 6*d.*	0	10	0
	37	run	..	7 by 7 oak parts, at 1*s.*	1	17	0
Square.				Labour on 190 squares roofing, at 5*s.*	47	10	0
1	89	sup.	..	1 in. rough gutter boards and bearers, at 15*s.*	1	0	8
	37	sup.	..	Centering, at 5*d.*	0	15	5
	162	sup.	..	Centering to tank, at 5*d.*	3	7	6
				Nails for roof, at 1*s.* 6*d.*	14	5	0
	24	run	..	Cross strutting to joists, 7 in. deep, at 2*d.*	0	4	0
			34	Turning pieces to window arches, average 3 ft., at 1*s.*	1	14	0
			24	Turning pieces to window arches, average 4 in. by 3 in., at 1*s.* 4*d.* ..	1	12	0
				Carried to Summary .. £	213	6	6½
				JOINER.			
9	sup.	..	..	1¼ in. rough grooved-iron tongued floor to granary and chop loft, at 19*s.* 6*d.*	8	15	6
			1	Extra to forming hatch with joints, ring, and bolt..	0	4	6
	32	run	..	4½ by 3, solid fir, wrought frames, at 4*d.*	0	10	8
	336	..	..	6 by 4, solid fir, wrought frames, at 6*d.*	8	8	0
	33	..	..	7 by 4, solid fir, wrought frames, at 7*d.*	0	19	3
	23	..	..	4½ by 3, solid fir, wrought frames, reg. heads, at 6*d.*	0	11	6
	114	..	..	6 by 4, solid fir, wrought frames, reg. heads, at 8*d.*	3	16	0
				Carried forward	£23	5	5

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Brought forward	23	5	5
	22	..	..	7 by 4, solid fir, wrought frames, reg. heads, at 9*d.*	0	16	6
	22	..	..	4½ by 3, oak main-tree to yard-gates, at 4½*d.*	0	8	3
	40	..	..	9 by 9, wrought oak posts, at 1*s.* 9*d.*	3	10	0
	40	..	..	Wrought, weathered, and rounded edge-capping to gates, at 4*d.* ..	0	13	4
				Doors.			
	367	sup.	..	1¼ in. wrought, framed, and braced, covered with 1 in. wrought, grooved, tongued and beaded boarding, batten widths, single hung, at 7*d.*	10	14	1
	52½	..	..	1¼ ditto ditto, with segmental head, at 8*d.*	1	15	0
	20	..	..	1¼ ditto ditto, hung folding, at 9*d.* ..	0	15	0
	265	..	..	1¼ ditto ditto, with square head, hung in two heights, at 7¼*d.* ..	8	0	1¼
	68	..	..	1¾ ditto ditto, hung sliding with iron rollers, bar, &c., complete, at 9½*d.*	2	13	10
	154	..	..	1¾ ditto ditto, segmental head, hung folding, at 9½*d.*	6	1	11
	132	..	..	1¾ ditto ditto, gates hung folding, at 9*d.*	4	19	0
				Windows.			
	82½	sup.	..	Wrought, rabbeted, and chamfered frames, 1½ in. casements, upper half hung on pivots, with set-offs complete, at 1*s.* 4*d.*	5	10	0
	12	..	..	Window-fixed casement, at 1*s.* 3*d.* ..	0	15	0
				Stable Fittings.			
	489	sup.	..	1½ in. rough deal boarding to stall divisions, at 2*d.*	4	1	6
	240	run	..	3 by 2¼, wrought fir-rails, at 1*d.* ..	1	0	0
	55	..	..	6 by 3, wrought fir runner, at 2½*d.* ..	0	11	5½
	55	..	..	6 by 3, oak wrought and rounded nosing to mangers, at 1*s.*	2	15	0
	64	..	..	6 by 6 ditto, and chamfered heel-posts, at 1*s.* 9*d.*	5	12	0
			9	Wrought-iron rings to mangers, at 3*d.*	0	2	3
			1	Iron angle manger for hayhouse ..	1	5	0
				Allow sum of 5*l.* for harness fittings	5	0	0
				Nag Stable Fittings.			
	120	sup.	1	1 in. wrought deal partition to loose-box, including door hung therein, with hinges and fastenings complete, at 2½*d.*	1	10	0
				Carried forward	£91	15	7¾

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	*s.*	*d.*
				Brought forward	91	15	7¾
	48	run	..	3 by 2¼ wrought deal rails, at 1*d.* ..	0	4	0
	48	..	..	3 by 2¼ wrought oak rails, at 4*d.* ..	0	16	0
			1	Iron angle manger for loose-box ..	1	5	0
			1	Iron manger and hay-rack complete	2	5	0
				Allow sum of 1*l.* for harness fittings	1	0	0
				Hospital.			
			1	Iron angle manger, with hay-rack ..	1	15	0
			25	Stable-door latches, at 10*d.*..	1	0	10
				Cow-house Fittings.			
	126	sup.	..	1 in. rough deal boarding to stalls, at 2*d.*	1	1	0
	174	run	..	3 by 2¼ wrought fir-rails, at 1*d.* ..	0	14	6
	168	..	..	4½ by 3 wrought fir-runners and rails, at 2½*d.*	1	15	0
	69	..	..	4½ by 4 wrought head posts, at 3½*d.*	1	0	1½
	120	..	..	4½ by 4½ wrought and chamfered oak heel-posts, at 9*d.*	4	10	0
	139	..	..	6 by 3 wrought oak nosing to mangers, at 1*s.*	6	19	0
			17	Iron fittings to cow-house and feeding stalls, at 4*s.* 6*d.* per head ..	3	16	6
				Calf-house.			
	54	run	..	Wrought fir-paling, 4 ft. high, ¾ by 2¼, including 2¼ by 3 rail and 5 gates, hung complete	3	3	0
				Root and Chop House.			
	374	sup.	..	1¼ wrought, grooved, and tongued fir boarding, rough, at 2½*d.*	3	17	11
	153	run	..	3 by 2¼ rough fir-rails, at 1*d.*	0	12	9
	50	run	..	4½ by 4 rough fir-posts, at 3½*d.* ..	0	14	7
			11	Pairs 13 in. hook-and-eye hinges, at 1*s.* 3*d.*	0	13	9
			2	Pairs 18 in. hook-and-eye hinges, at 1*s.* 9*d.*	0	3	6
			20	Pairs 30 in. hook-and-eye hinges, at 2*s.* 9*d.*	2	15	0
			8	Pairs 42 in. hook-and-eye hinges, at 3*s.*	1	4	0
			5	Pairs 20 in. T-hinges, at 1*s.* 10*d.* ..	0	9	2
			5	6 in. neck bolts, at 9*d.*	0	3	9
			12	9 in. do. at 1*s.*	0	12	0
			31	9 in. barrel bolts, at 1*s.*	1	11	0
			2	12 in. do. at 1*s.* 3*d.*	0	2	6
			6	18 in. do. at 2*s.* 2*d.*	0	13	0
			8	9 in. wardstock locks, at 4*s.*	1	12	0
			2	10 in. do. at 5*s.* 6*d.* ..	0	11	0
			1	Norfolk thumb latch, at 1*s.*	0	1	0
				Carried to Summary	£138	16	6¼

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.		£	s.	d.
				Smith and Founder.			
				Wrought-iron King and tie-rods in roofs, with nuts and washers complete	31	16	0
			56	$\frac{5}{8}$ in. heel-bolts, 1 ft. 6 in. each, at 6*d.*	1	8	0
			36	$\frac{5}{8}$ in. heel-bolts, 1 ft. 9 in. each, at 7*d.*	1	1	0
			70	$\frac{3}{4}$ dog anchors, 2 ft., at 1*s.*	3	10	0
			46	Iron straps to head of principals, 2 ft. by 3 in. by $\frac{3}{8}$ in., at 4*s.* 1*d.* ..	9	11	8
30	run	..		MacFarlane's cast-iron centre gutter, No. 35, at 7*s.* 7*d.*	11	7	6
$43\frac{1}{3}$	run	..	..	Cast-iron round stack-pipes, including nails and fixing, at 1*s.* 7*d.* ..	3	8	$7\frac{1}{2}$
$142\frac{1}{2}$	..	..	..	4 in. half-round cast-iron guttering, at 1*s.* 1*d.*	7	14	$4\frac{1}{2}$
			12	Stopped ends, at 1*s.* 4*d.*	0	16	0
			9	Socketed outlets, at 2*s.*	0	18	0
			1	Purpose-made exterior angle, at 2*s.*	0	2	0
129	..	..	6	Half-round cast-iron guttering, at 1*s.* 8*d.*	10	15	0
			10	Stopped ends, at 2*s.*	1	0	0
			5	Socketed outlets, at 3*s.* 6*d.*	0	17	6
			1	Galvanized-iron boiler, 24 in. diam.	1	5	0
			1	Heater stove, 16 in. opening	0	8	0
			16	Wrought-iron hit-and-miss windows, 3 ft. by 3 ft. 6 in., at 18*s.*	14	8	0
			12	Cast-iron columns, 10 ft. long, with moulded bases and copes, at 1*l.* 5*s.*	15	0	0
			1	Hoist and crane in granary, to work on pivots (at about 4*l.*)	4	0	0
				Carried to Summary	£119	6	8
				Plumber.			
Cwt.	qrs.	lbs.					
13	1	21	..	Milled lead and labour in gutters, valleys, flushings, and step flushings	16	0	6
Yards.	Feet.	Inches.					
5	..	..	..	$\frac{5}{8}$ in. lead pipes, weighing 9 lbs. per yard, at 1*s.* $10\frac{1}{2}$*d.*	0	9	$4\frac{1}{2}$
$16\frac{2}{3}$	..	..	..	$1\frac{1}{4}$ in. lead pipes, weighing 15 lbs. per yard, at 3*s.* $1\frac{1}{2}$*d.*	2	12	1
$45\frac{1}{4}$	..	..	..	$1\frac{1}{2}$ in. lead pipes, weighing 17 lbs. per yard, at 3*s.* $6\frac{1}{2}$*d.*	8	0	$6\frac{3}{4}$
			26	Soldered joints, at 1*s.* 6*d.*	1	19	0
			11	$\frac{5}{8}$ in. Guest and Chrime's brass high-pressure bib-cocks, at 7*s.* 6*d.* ..	4	2	6
			1	20-gallon galvanized-iron tank, at 10*d.*	0	16	8
			1	300-gallon galvanized-iron tank, at 5*d.*	6	5	0
				Carried to Summary	£40	5	$8\frac{1}{2}$

BILL OF QUANTITIES AND DETAILED ESTIMATE—*continued.*

Yards.	Feet.	Inches.	No.	*Painter.*	£.	*s.*	*d.*
433	43⅓	run	..	Two coats of anti-corrosive paint on 3 in. stack pipes, at 1½*d.*	0	5	5¼
	142½	..	..	Two coats of ditto ditto, on 4 in. gutters, at 2*d.*	1	3	9
	129	..	..	Two coats of ditto ditto, on 6 in. gutters, at 4*d.*	2	3	0
314	sup.	..	..	Three coats on joiner's work in anti-corrosive paint, at 6*d.*	7	17	0
			29	Sashes and frames, at 1*s.* 3*d.*	1	16	3
				Carried to Summary	£13	5	5¼
				ESTIMATE, &c., FOR DUTCH BARN, 20 ft. by 132 ft. by 18 ft. high.			
				Timber	42	5	0
				Nails and felt	12	16	3
				Iron work	2	3	4
				Joiner's work	8	8	0
			18	Stone blocks, at 6*s.*	5	8	0
				Strutts for roof	0	18	4
				Eaves-boards	0	18	0
352	..	..	..	Labour on tarring	2	4	0
				Tarring timber	0	6	0
				Scaffolding	0	7	6
				Bricklayers' setting-stones	0	13	0
				Mortar and old tiles for ditto	0	10	0
				Tar for roof	1	6	0
	11	..	..	Clout nails, at 7*d.*	0	6	5
		1	..	Nails	0	5	3
					£78	15	1
				SUMMARY.			
				Excavator	107	12	5
				Bricklayer	469	11	7¼
				Tiler	179	4	11
				Mason	19	13	5½
				Carpenter	213	6	6½
				Joiner	138	16	6¼
				Smith and founder	119	6	8
				Plumber	40	5	8¼
				Painter	13	5	5¼
				£	1301	3	3
				Estimate for difference of barn roof, if slated	26	2	6
				Ditto for two Dutch barns	157	10	2
				Allowance for builder's profits, at 15 per cent.	222	14	3
				£	1707	10	2

XXXII.—*Report upon the Market-Garden and Market-Garden Farm Competition*, 1879. By CHARLES WHITEHEAD, Barming House, Maidstone.

AMONG the numerous and liberal premiums that were offered by the Mansion House Committee in connection with the International Exhibition of the Royal Agricultural Society of England, were handsome prizes for market-gardens and market-garden farms. It was expected that there would be a large entry in the three classes of this competition, seeing that so much of the land near London, upon all sides of the Metropolis, is devoted to market-gardening, in which much skill is displayed and a large amount of capital invested; while beyond the limit of market-gardens proper, the cultivation of vegetables and herbs is extensively adopted in alternation with ordinary farm crops, upon what have been styled market-garden farms. The Mansion House Committee and the Council of the Royal Agricultural Society were, however, much disappointed to find that but little interest was taken by the market-gardeners and farmers, and it was thought by some that the competition had not been sufficiently made known to the public. The first announcement of it was advertised for some time in the Agricultural and Horticultural Journals, and failed to attract more than two or three competitors. The Council of the Royal Agricultural Society therefore requested these to allow the time for sending in entries to be extended, and with their concurrence the schedule of prizes was again advertised for some weeks in the same and in other journals, without much result; for in the end it was found that only two entries had been made in each class.

No doubt a feeling of jealousy, and an unwillingness to let the secrets of the prison-house be made public, prevented many from entering. It was ascertained by the Judges during their peregrinations that there was a decided objection on the part of many market-gardeners and market-garden farmers to have their market-gardens and farms inspected, and their methods of cultivation and systems of cropping reported upon, and their profits made known to the world. Some had an idea that their landlords would raise their rent if they saw "in print" that their tenants were making a good thing out of their land. This notion has, it is believed, in many instances prevented competition for the prizes offered by Local Committees, or private individuals, for farms in the neighbourhood and at the time of the annual Exhibition of the Royal Agricultural Society.

The main object of the Mansion House Committee in offering

these prizes was to extend and improve the cultivation of vegetables and herbs, and to bring a better supply of these almost essential elements of food within the reach not only of the artisans, mechanics, and workers of all kinds who rarely can get them, but also of the very many members of what are styled the lower middle classes, dwelling in London and other cities and towns, in whose households fresh vegetables are almost equally scarce commodities. The Mansion House Committee may also have desired to point a moral from the success of market-gardeners for the benefit of agriculturists, and to show them that they may profitably add the culture of at least the most hardy, and most easily grown vegetables to their usual routine of farm production. Hints of this kind, leading to a practical result, will be gladly welcomed in this much perplexed, transitional state of agriculture, where the values of the present staple products of the farm are materially depreciated by foreign importations. Those fortunate market-gardeners who live within the charmed area—the radial limit of twenty miles prescribed by the rules of this competition—hardly need fear that their occupation would be gone, though their balance-sheets and methods of culture were proclaimed from the house-tops. They have the great advantage of being within reach of London by road, so that they are enabled to load up to market with produce and back with manure. They have also a suitable soil, and an established business, with the special knowledge that is necessary to carry it on. Market-garden farmers, who are within easy distance of London, equally share these advantages of establishment, experience, and a trained staff of labourers, and have besides, in common with the market-gardeners, a local reputation and a name in very many cases. Thus one man is famous for his celery. The lettuces of this one are peculiarly crisp; while the cabbages of that one are always succulent. But there is ample room for many more vegetable growers. Though occasionally there may be a glut of certain vegetables, which is to a great extent caused by the imperfect methods of distribution, to be explained farther on, there would always be a very large and increasing demand for vegetables at a fair price, which would at the same time remunerate the producers. It is said that the importation of vegetables from foreign countries interferes most considerably and will interfere much more each year with the home growers; it will be shown, however, that the supply from abroad comes for the most part before the English vegetables are ready, also that the cost of carriage is a heavy burden upon the importers.

In most seasons and at most times in each season the price

of vegetables prohibits the working classes, the lower middle classes, and even many families of the middle class with fixed incomes, from having them at their tables save as articles of luxury instead of regular essentials of diet. No doubt the price of all vegetables is greatly enhanced by the system of selling and the unsatisfactory media of distribution, as in the first place all market-garden and market-garden farm produce is sold by a salesman or factor, whose pay or commission is of course added to its cost. These sell it to middle-men, chiefly greengrocers, who take the *crême de la crême* and require their handsome profit. Costermongers as a rule take the leavings of the greengrocers and make as much profit as they can get out of these. Jobbers occasionally buy the crops of the growers, either as they grow, or delivered into their carts and waggons on the spot. These expect a good "pull" for their venture, to which must be added the salesman's pay and the middleman's profits. As in the case of almost all home-produced articles of food, the producers and the consumers of vegetables are too far apart, and before either of these can get their full and proper advantages this gulf must be bridged over in some way.

Factors and middlemen must be content to work for less money, or the producers and consumers must co-operate to provide huge supply associations in London and all cities and large towns, not only for vegetables, but also for fresh butter, milk, cream, fowls, and eggs, all of which now are simply beyond the reach of the majority of the people. How very few are the farmers who attempt to supply these, as they think, small things! We calmly allow the French and the Danes to beat us in butter and fancy cheese-making, and to send in fowls and eggs at their own price, and have hitherto made but little effort to check the importation of "fresh" vegetables from France, Holland, Spain, and Africa. It is hoped that we shall try to change all this before we finally despair of making farming pay in this country.

Vegetables of all kinds were almost at famine prices in the English markets in the early spring of this present year. The long continued frost had proved too much for the cabbage-tribe in many situations. Those who were lucky enough to preserve any kind of greens obtained very high prices for them. Such small things as parsley actually were almost worth their weight in silver, because so few persons think it worth while to cultivate such unconsidered trifles. After the frost came an almost unparalleled period of wet, which prevented the sowing of crops in due season, and caused an abundant growth of weeds, which it was almost impossible to keep in subjection. Indeed there hardly

could have been a worse season for the competition. Everything fought against the careful cultivation of land; and the Judges put off their first inspection until the end of April, at the request of the competitors, who told them there was nothing to be seen before this date. They were struck with the energy and indomitable perseverance of all these, and with the comparative freedom from weeds in the competing gardens and farms at their last visit.

In this competition there were three classes, in each of which a first prize of 50*l.*, a second prize of 25*l.*, and a third prize of 10*l.* respectively were offered, viz.:

CLASS I.

For the best managed market-garden, exceeding ten, and not exceeding fifty, acres in extent, within a radius of twenty miles from the Mansion House.

CLASS II.

For the best managed market-garden above fifty acres in extent, within a radius of twenty miles from the Mansion House.

CLASS III.

For the best managed market-garden farm situated in one of the five metropolitan counties, viz.: Kent, Surrey, Middlesex, Hertfordshire, and Essex; or, if situated in any other county, such farms to be within a radius of fifty miles from the Mansion House, upon which market-garden crops alternate with farm crops, above one hundred acres in extent. With regard to Classes I. and II. the Judges were instructed especially to consider:

1. General management with a view to profit.
2. Productiveness of crops.
3. State of gates, fences, roads, and general neatness.
4. Method of book-keeping pursued.

Concerning Class III. their instructions pointed to:

1. General management with a view to profit.
2. Productiveness of crops.
3. Goodness and suitability of live stock.
4. Management of grass and clover land.
5. State of gates, fences, roads, and general neatness.
6. Mode of book-keeping pursued.

The accompanying Schedule (p. 837) shows the names of the competitors in the various classes, as well as those of the owners

of the land, the extent of each holding, and the nature of the soil.

Class I.

Mr. William John Gay's Market-garden.

The Judges awarded the first prize in this class to Mr. W. J. Gay, for his exceedingly well-managed market-garden, forty-four acres in extent, situated close to the town of Barking, in Essex.

This is a typical market-garden, worked in the most approved manner, with every inch of it highly and thoroughly cultivated. Mr. Gay has no particular rotation of crops; but he endeavours to get as much as he can off the land, and to suit the course of cropping to the season, as well as to what he imagines will be the chief requirements of the markets. Most market-gardeners prefer to work in this manner, and grow what they think will pay them best. A few, however, like Mr. Lancaster, who competed in another class, grow specialities, as celery, for example; but, as a rule, the rotation depends upon circumstances in a great degree. Thus, in the present most backward and trying season, many of the crops were late before they were got off, so that there was not time to put in the crop that should have followed in due course. In some cases the crops, as winter onions, cabbages, coleworts, and other greens, were destroyed by the frost, necessitating an entire change in the arrangements. Again, in many instances, scarlet-runners, French beans, carrots, parsnips, cucumbers, and vegetable-marrows, and these two last especially, were so much injured by the wet and cold weather, that they were ploughed up.

Mr. Gay's aim is to get two crops in the year, if possible, from every part of his holding. He sows onions, carrots, parsnips, spinach, peas, and potatoes, in the early spring, after the winter "greenstuff"—such as hardy greens, or coleworts, known as collards, savoys, purple sprouting broccoli—has come off the land. After cabbages, which should be all cut in ordinary seasons quite by the end of May, Mr. Gay plants potatoes, scarlet-runners, French beans, blue peas, red beet, marrows, cucumbers, and summer lettuces. Where cabbages come off latest, peas are sown between the rows, or Lisbon onions for "bunching" in early spring, or savoys, or coleworts, or winter spinach. Mr. Gay grows all manner of herbs: thyme, marjoram, sage, mint, parsley, and lemon thyme, and his large bed of beautifully shaped winter lettuces was a sight to be remembered, considering the ordeal of weather the plants had passed through,

SCHEDULE of MARKET-GARDENS and MARKET-GARDEN FARMS entered for COMPETITION for the PRIZES offered by the MANSION HOUSE COMMITTEE.

CLASS I.

Name and Address of Competitors.	Name and Address of Owners.	Size of Farm. Arable. A.	R.	P.	Pasture. A.	R.	P.	Description of Soil.
1. William John Gay, Axe Street, Barking, Essex	Mr. Kennedy and Others, Fawley, Southampton	44	0	0	..			Light and medium, with gravelly subsoil.
2. William Gay, Corbetstye, Romford, Essex	Major Russell, Stubbers, Romford	40	0	0	5	0	0	Medium, with loamy subsoil.

CLASS II.

1. John Lancaster, Vine House, Canning Town, Essex	Gas and Coke Company, Westminster, and Others	77	0	0	3	0	0	Heavy.
2. Thomas Patch, Faircross, Barking	Sir E. Hulse, Bart., Breamore, Salisbury	90	2	0	5	0	0	Light and medium; chiefly gravelly subsoil.

CLASS III.

1. Trustees of late J. C. Circuit, Rainham, Essex; Henry Swann, Manager	J. W. Lambert, Esq., Castle Farm, Ongar, Essex	130	0	0	38	0	0	Mixed, with gravelly subsoil.
2. William Wallis Glenny, Cecil House, Barking	Marquis of Salisbury, K.G., Hatfield House	205	0	0	3	0	0	Light, with gravelly subsoil.

and made a most important addition to his receipts for the year. The land is hired on a lease of fourteen years, which gives an enterprising tenant spirit to garden well; though it was ascertained that by no means all market-gardeners are protected by leases, in spite of their extremely large outlay in the shape of manures and cultivation.

The soil of this market-garden is a darkish clay upon the London Clay formation, from three to four feet in thickness, resting upon a thick bed of gravel. It is not naturally very fertile, but is grateful and works well.

Four horses of a most serviceable stamp for land and road work, quick movers, yet large-framed, which cost from seventy to eighty guineas, and a pony, are fully employed upon the forty-four acres. This may appear to be an excessive strength of horses; but the greater part of the land is ploughed twice in the year, and the whole of the produce is taken by horses to the Borough and Spitalfields Markets, respectively distant eight and seven-and-a-half miles from Barking. Manure from the stables and cowsheds is brought back from London in the waggons and vans that have taken up the vegetables to the markets, as much as six waggon loads per week having been brought on the farm during the six months preceding the Judges' visit. Six shillings per ton is the cost of this manure, and not less than thirty tons are put on an acre, with but few exceptions, for every crop. Besides London dung, horse-hoof parings at from three to four tons per acre, horn shavings at eight to ten cwts. per acre, bone dust at ten cwts. per acre, guano at five cwts. per acre, nitrate of soda at from two to four cwts. per acre, are used. Nitrate of soda is found to answer remarkably well for cabbages and onions upon this land, being applied in two dressings of from one-and-a-half to two cwts. per acre. The average annual cost of London manure upon Mr. Gay's land is 270*l.*, or 7*l.* per acre; and the average annual cost of artificial or other manures is 130*l.* or 3*l.* per acre, making a total expenditure of 10*l.* per acre per annum for manure alone. It cost Mr. Gay 595*l.* last year for labour, or, 13*l.* 10*s.* 5*d.* per acre; and it will cost him more this year on account of the rampant weeds.

Mr. Gay was one of the lucky market-gardeners who had a good quantity of "greenstuff" in the early spring of this year. Much of this either had been cut up entirely, or much retarded in growth by the long-continued frosts; and the price of all green vegetables was consequently unusually high in April. On the occasion of their first visit the Judges found Mr. Gay engaged in pulling a capital crop of well-grown coleworts, which were making figures evidently most satisfactory to him. According

to the crop, set at the least at 250 dozen bunches per acre, and the prices which were then ruling, viz., at from 9*s.* to 12*s.* per dozen bunches, the gross return of this crop must have been considerably above 100*l.* per acre. Later on, when all the coleworts had gone and cabbages were cabbages, Mr. Gay was cutting large quantities from one of the best pieces that was seen in the travels of the Judges, and the gross return was at least 80*l.* per acre. All the peas which had followed the earliest hardy greens looked remarkably well at the first visit. These, as well as some that were put in later, were decidedly the best that were seen. The earliest peas were Sangster's William I., and Sangster's Improved No. I., and the seed cost from 16*s.* to 24*s.* per acre, two bushels being drilled per acre, about two feet to two feet four inches apart. After these, the Fill-basket, Fortyfold, or Veitch's Perfection followed in succession. An average crop of peas is about 150 bushels per acre, and the average price obtained in market is about 2*s.* per bushel, or 15*l.* per acre. It is not a very remunerative crop, as the expenses of picking are heavy; but it only occupies the land for a short time, and serves as a good preparation for other crops. Onions are largely grown upon this market-garden, chiefly after winter greens, savoys, and sprouting broccoli, and looked very promising. Mr. Gay sows 50 lbs. of onion seed broadcast, so that the plants were exceedingly close together, as they were intended for pulling early for bunching, and some later on for pickling. Though the elements had been unpropitious for carrots, there was a capital plant both of Harrison's Early Market, and Carter's Early Short-horn for pulling or "bunching" in June, in ordinary seasons. About 12 lbs. of seed are sown broadcast per acre. Six pounds of parsnip seed, of the sort known as the Hollow Crown, had been drilled per acre in rows 15 inches apart, and had given an excellent and regular plant. Scarlet-runners also were remarkably good; but the French beans showed that they wanted heat. Mr. Gay contemplated ploughing these up at first, and fortunately held his hand, as they improved wonderfully in June and bid fair to give a remunerative yield. This, it must be said, was the only crop that was at all under the mark in the whole of this occupation, and it took up a very small portion of it.

Upon a detached part of this holding, a quarter of a mile from the homestead, small things are cultivated. There were lemon thyme, mint, sage, parsley, quite ornamental with its beautifully curled leaves, which was making 3*s.* 6*d.* per lb. in the London markets, perfectly shaped little Paris Cos lettuces, and other "sallets," all in a most flourishing state. Rhubarb also, beet, and red cabbages, for pickling, thrived amazingly;

and in a corner was a large border of odorous wallflowers, small bunches of whose flowers were making 4*d.* each. Here is variety enough in all conscience! Mr. Gay grows many things and grows all well and successfully, for while many of his neighbours either had lost plant of parsnips, carrots, scarlet-runners, French beans, and onions, by reason of the onslaught of slugs, or the rapid progress of weeds, or from stress of weather, all his crops were good, with one slight exception—the French beans. His land was remarkably clean for the year, and his style of gardening finished and neat; and the Judges had not the slightest hesitation in awarding him the first prize in this class.

The weak point in Mr. Gay's armour is his book-keeping. This is somewhat rudimentary, though it is at the same time sufficiently plain to convince the Judges that his balance is on the right side, and that he makes his market-gardening profitable. As a rule it appears that market-gardeners do not keep accounts. In the first and second class of this competition the "method of book-keeping" was found to be of the simplest order. One competitor frankly said that he kept no accounts—"My bank-book is my account-book." Another took his cheque-book from his pocket, with a triumphant wave in the air, remarking that he required no other "method of book-keeping," thereby leading the Judges to infer that his banking account was in the most flourishing condition. It reminded them of the indignant protest—*Rex sum, et super grammaticam*, or, in the vernacular, "I am a market-gardener; I make such profits that I can dispense with figures." Sundry small account-books were produced by one competitor, merely containing lump sums representing receipts on the one side and payments on the other—records of weekly sales and weekly payments. Failing complete accounts, the Judges accepted secondary evidence with regard to profit and loss, in the shape of the general prosperous appearances of the market-gardens and the contented minds of the market-gardeners themselves, which were pleasant to contemplate, while every one else connected with land was groaning and grumbling. They saw enough to show them that labour is the most serious item of expenditure, particularly in wet seasons like the present, when it was most disheartening to see weeds hoed up one day at great cost and set again the next. There is a good supply of general labourers in most of the market-garden districts of Essex, but skilled labour is somewhat scarce. Wages run from 3*s.* to 3*s.* 6*d.* per day for men, and from 1*s.* 3*d.* to 1*s.* 9*d.* for women. The greater part of the work is done by the piece. Contracts are made with the labourers to keep onions clean through the season at from 4*l.* 10*s.* to 5*l.* per acre, for which they are ex-

pected to hoe them over three times. Carrots, sown broadcast, are put out for hoeing at from 3*l.* to 4*l.* per acre; parsnips that had been drilled in, at 2*l.* 5*s.* to 2*l.* 10*s.* per acre. Preparing vegetables for market is also a costly process, as such things as carrots, parsnips, radishes, celery, onions, and lettuces have to be taken to sheds and washed, and done up in bunches for market. Upon Mr. Gay's market-garden there is suitable convenience for these operations, and great pains are taken to send away the produce fresh and clean.

Mr. William Gay's Market-garden.

This market-garden, to which the Judges awarded the second prize, is situated at Corbetstye, about five miles south-east of Romford, upon the London Clay formation. Its soil is of a lighter colour * than that at Barking, containing less iron and more sand in its composition, and not so valuable, nor so well suited for gardening purposes, being more inclined to cake or crust over, after a heavy rain. The superficial soil is from two to four feet in thickness, and the gravel bed immediately under it is from five to six feet deep. Mr. W. Gay pays 2*l.* 2*s.* per acre rent for the land, and holds it upon a twenty-one years' lease. There are several acres of useful meadow-land, part of which was fed off by two useful dairy cows, and part laid in for hay, that promised to give a heavy cut.

Like his namesake, the occupier of this land has no stereotyped rotation of crops, but is guided by circumstances in this respect, and he endeavours to get, and usually succeeds in getting, two crops every year from the greater part of the land. His arrangements for the present year comprised:

Four and a half acres of onions, succeeding coleworts, which had been preceded by cucumbers and scarlet-runners. These were very good and were found very free from weeds at each visitation. In a piece of scarlet-runners of nearly three acres there was a fairly good plant; coleworts had been taken before these, and onions before the coleworts. Next came ten acres of potatoes, principally Shaws and Dalmahoys; after these—coleworts, sprouting broccoli, seed-bed, and small crops, put in early and the ground heavily manured. The cucumbers upon the next piece of two and a half acres were an indifferent plant, as much of the seed had rotted in the ground, and the slugs had been busy among the few plants that were above the ground. Spring

* The brown colour of the London Clay at and near the surface is merely a colour of decomposition, the protoxide of iron that gives the blueish tinge peroxidating by exposure to atmospheric action.—'Memoirs of the Geological Survey of Great Britain,' vol. iv. part i p. 73.

cabbages had immediately preceded the cucumbers, and onions had come before the cabbages. Close by the cucumbers were two acres of pretty good East-Ham cabbages, planted in the early autumn after onions, before which scarlet-runners had been grown. Late spring coleworts, of which only a few stragglers not ready for cutting remained, had occupied the adjoining two acres, whose antecedent crops were cucumbers and coleworts.

A forward and good piece of mangel-wurzel was next seen, before which cabbage, broccoli and other seeds had been taken, for Mr. Gay, like many other market-gardeners, grows much of his own seed from carefully chosen plants. He was lucky to have near here over half an acre of uncommonly good lettuces, well-grown in every way, which had borne the trying season unusually well, grown after scarlet-runners and coleworts; a first-rate seed-bed of cabbages and sprouting broccoli, after potatoes, one and a half acres in extent; also a good Tripoli onion seed-bed. Patches of spinach, parsley, and other herbs, after mangel-wurzel, occupied the remaining portion of this market-garden.

Some idea of the course of cropping will be gathered from the above description. It will also be seen that the land has no fallow, no rest, and that it is attempted to obtain two crops in the year from it. In one or two cases that end will not be accomplished this year on account of the weather, which had evidently affected the crops upon this land more than those upon the land near Barking, either by reason of the somewhat different nature of the soil, or to the country round about being more wooded. Some of the crops were rather patchy and wanting in vigour, which partly may be due to the fact that Corbetstye is at least sixteen miles from London—the great source of manure supply. This is a great disadvantage, as the waggons that have taken up produce are very rarely laden with manure on the return journey, on account of the distance, and the manure has to be hauled, by traction-engines or horses, from Rainham, to which place it is brought by rail or river, and costs 8*s.* 6*d.* per ton. All the buildings appeared commodious, and in good tenantable repair; and the gates, fences, and hedges serviceable and trim. Four horses are kept, of a useful stamp. The supply of labour is not so good, nor of such skilled quality as at Barking. Mr. Gay sells his own produce himself in the Borough Market, which saves him the high commission charged by salesmen. Taking one year with another, the cost of manual labour, inclusive of preparing and washing the vegetables for market, is about 490*l.* per annum, or close to 11*l.* per acre, which, together with 11*l.* per acre for manure, according to Mr.

Gay's estimate, makes 22*l.* per acre. Rent, rates, which amount to about 3*s.* 9*d.* in the pound, tithes at 9*s.* per acre, the cost of horses, waggons, vans, baskets, and other incidentals, quite bring up the annual expenditure to 30*l.* per acre. From the books shown to the Judges, which contain merely entries in the shape of lump sums of receipt and expenditure, and from other sources of information, it appeared that, taking the average of the past four years, one of which—1878—was by no means favourable for market-gardening, Mr. Gay's business had returned a handsome profit, equal to 11*l.* per acre per annum, or equal to an interest of something like seventeen per cent. per annum upon the capital employed. Taking into consideration the very neat and clean state of this market-garden, the Judges considered that Mr. Gay deserved the second prize for his perseverance.

Class II.

Mr. Lancaster's Market-garden.

This comprises eighty acres, situated at Stratford, in Essex, within four and a half miles of the General Post Office, and is, with the exception of a few pieces of land at Rotherhithe and Deptford, the nearest market-garden to London. Three acres are meadow land and the remainder is closely cropped with various vegetables. The land is partly held on lease and partly upon a short tenancy, at rents varying from 5*l.* to 6*l.* per acre. Its soil is a dark-coloured loamy clay, heavy and naturally fertile, about eight feet in thickness, resting upon a peaty subsoil two feet in depth, lying on the gravel, upon the Woolwich Beds, or the Oldhaven Beds of the Lower Tertiaries, which crop up here and overlie the London Clay, forming a curiously irregular patch nearly two miles in length from north to south, and hardly a mile in width.* Though heavy and difficult to work in wet seasons, this soil soon dries and becomes pulverised quickly and absorbs a deal of moisture. In Mr. Lancaster's words:—"It is peculiar stuff to work and requires an apprenticeship before you can manage it according to the varying seasons. It is most prolific when there is some amount of heat, when we say 'things go mad.' I have had Veitch's spring sown cauliflowers measure four feet round, and quite close, and celery one foot round, indeed like sturdy trees."

* "This series seems to stretch across the Thames into Essex, and perhaps the inlying patch of the Lower London Tertiaries at Stratford may belong to it, at least in part."—'Memoirs of the Geological Survey of Great Britain,' vol. iv. part i. p. 258.

Mr. Lancaster has with much ingenuity adopted irrigation upon his market-garden most successfully in dry summers, having fixed a steam-engine to pump up the water, and laid pipes and cut channels to spread it over the land. A wide sewer or watercourse whose water runs into the Thames intersects this land, and small ditches connected with this watercourse divide it at intervals. These formerly served as fences to part the fields when it was pasture land and grazed by cattle. In wet seasons like the last it happens that the water in these ditches overflows, and in this event the steam-engine is used to pump it out. Mr. Lancaster said that he is the only market-gardener, except those who have sewage-farms proper, who systematically irrigates his land in dry seasons. "My neighbours," he added, "laughed at first when I began to irrigate, but the first season I did so turned out to be a very dry one, so that I had good crops when others were bad, and therefore made high prices, which stopped their laughter." When the Judges went over this market-garden the engine was pumping the surplus water away from the land. Only about twelve years ago the whole of this garden was grass land, and has been gradually broken up by Mr. Lancaster. He has built a comfortable dwelling-house, with stables, sheds, green-houses, forcing-pits, and an engine-house, and has changed the land from average grazing land to highly productive, profitable market-garden ground, fitted with all appliances for its management.

As the soil is heavy and lies wet in the winter and is unsuitable for growing winter greenstuff, so much so that Mr. Lancaster cannot grow his own cabbage plants, it is found much better to let much of the land lie dormant during the winter, and to work it as hard as possible in the spring and summer when it has been dried by March winds. Therefore the system of cropping differs from that of ordinary market-gardens, inasmuch as radishes, lettuces, marrows, cucumbers, spring onions, cauliflowers, and celery are principally grown. Celery is Mr. Lancaster's speciality, which he grows singularly well, and for which his soil is peculiarly suited. He has a reputation for celery in Covent Garden, and almost invariably makes the top prices in the market. He either sows the celery seed first in frames with a certain amount of heat, from whence the plants are put out into the rows; or the seed is sown in hot-houses having a high temperature, and the plants are pricked out into small frames close to the ground, with a gentle heat under them, and taken from thence for planting out. This plan answers well in cold, changeable seasons, as the plants are gradually accustomed to changes of temperature; but it entails

a great amount of work, of which some idea may be gained when it is stated that it requires 10,000 celery plants per acre, set at one foot apart in the rows, and that Mr. Lancaster usually plants about 46 acres, which would take 460,000 plants. London manure to the depth of a foot is put into the trenches prepared for the celery plants, and covered with soil. The trenches are 5 feet 6 inches apart, and the distance from plant to plant in the trenches is one foot. Earthing up is done by hand gradually, three or four times, to suit the growth of the plants. Early in the next spring radishes are sown thickly upon the spaces lately occupied by the celery; or cauliflowers or coleworts are planted, all of which thrive wonderfully in the richly manured soil. Celery is grown again in the next season. In many parts of this land, where the soil is best suited for celery, this crop has been taken now five years successively, the position of the trenches having been shifted each year, and radishes and other quick growing crops grown upon their situation in alternate years. The beds of radishes are 4 feet 6 inches wide, and one foot is allowed for the celery trenches, so that in the autumn when the catch crops are gone the celery has a space of 5 feet 6 inches. At the time of the first inspection over 5000 dozen of bunches were being marketed each week, and made from 6*d.* to 8*d.* per dozen bunches. They were turnip radishes, known as French radishes in the market, of a bright pink colour, beautifully shaped and cutting firm even to the largest and oldest bulbs. As many as 1500 dozen bunches are occasionally grown per acre, but an average crop runs to about 1200 dozen bunches, a bunch being a good sized handful.

In other parts of the land coleworts, or cabbages, or cauliflowers were planted in the spaces between the celery, and in one part there were rows of splendid Paris Cos lettuces ready for tying, and the celery plants between were looking fresh and vigorous. Near the house there were innumerable small frames set in rows with plants of vegetable-marrows within them, which were covered with glass by night and served to protect the plants from the weather until they were well established. These plants were strong and luxuriant, and in fact were almost the only marrows that the Judges saw which looked like yielding a good crop. Rows of osiers were planted at intervals in this place to serve as a shelter for marrows, or cucumbers, or other delicate plants that may be cultivated. Osiers are grown upon most of the market-gardens in corners or wet places, to furnish twigs for bunching radishes, and other produce, and rods for making baskets. Near the marrow frames were many hundred thousands of Veitch's cauliflower plants in a seed-bed, and many

thousands in small frames with a little heat from manure under them, that had been transplanted from the seed-bed, and were ready to go out into their places on the land, being splendid plants, showing no tendency to "run," and having well paid for their intermediate transplantation.

It was a novel experience to find two acres covered with mint, with an abundance of leaves that seemed sufficient to supply all the lamb eaters in London with mint sauce. Although this bed of mint was only two years old it was doomed to be dug up this summer, and tiny shootlets were being taken from it and set 9 inches by 3 inches apart, in an adjoining piece of land to form a new bed. It was suggested that it was a pity to destroy such a wealth of mint, but Mr. Lancaster inferred that he had already found it a satisfactory and sufficient mint of wealth. There were three acres of sea-kale, six acres of horse-radish, which thrives upon this soil, one acre of parsley, patches of beet, and of cabbages for pickling, and large beds of rhubarb, and divers other things, all of which are shown as *in situ* upon the plan (p. 847) of this market-garden. Among the material cabbages and cauliflowers were plots of ground devoted to moss-rose bushes, which were just bursting into buds to adorn the button-holes of London beaux.

The rhubarb plants are a sight to be seen, having elaborately serrated leaves, and are handsome enough for ornamental shrubs. It is a peculiar sort of rhubarb, and the Judges saw nothing like it in their travels. Mr. Lancaster grows it about four feet apart, and strips the plants bare of leaves twice and sometimes thrice in a season, leaving nothing but the main stem. Like all the other crops grown on this market-garden, the rhubarb is well manured each year with London manure.

As Mr. Lancaster does not indulge in the luxury of accounts, being, as he said, too tired to write after his marketing, for he and his daughter sell all his produce, no definite notion of the quantity of manure bought in a year could be obtained. Neither could the Judges get any precise information as to the cost of labour, but they were assured, and can well believe from the amount of work that is entailed by such crops as radishes, celery, and lettuce, that the labour comes to 50*l.* per week during the summer and autumn months. Labour wages are rather higher than at Barking. Carters and skilled hands get from 20*s.* to 24*s.* per week. Ordinary labourers get 18*s.* per week, and both these and skilled labourers make considerably more at piece-work. Women earn 2*s.*, 3*s.*, and even 4*s.* per day. Seven horses of a good stamp are kept, which do all the work on the market-garden and take the vegetables to the

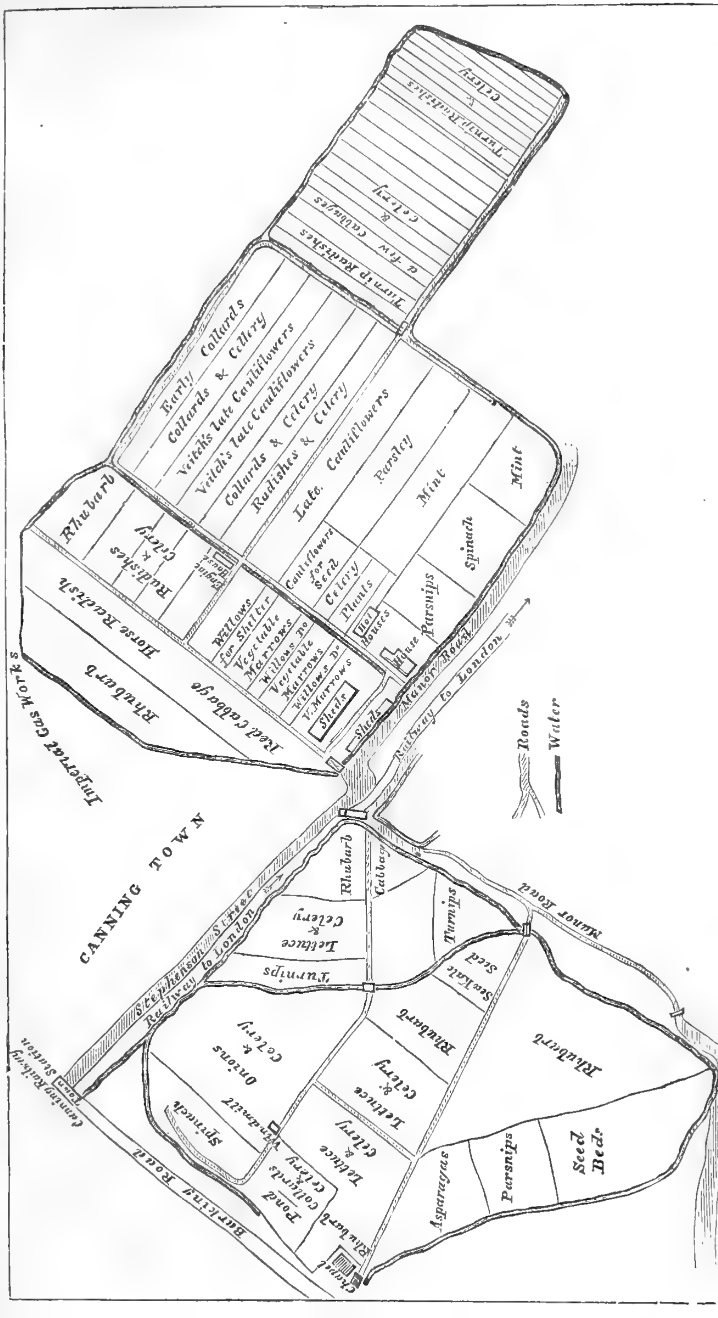


Fig. 1.—Mr. J. Lancaster's Market-garden.

Borough and Spitalfields Markets in the summer, and the celery to Covent Garden in the winter, when it sells best. The buildings are suitable and in good repair, and there are capital sheds for preparing and washing the vegetables for market, fitted up with boilers for heating water for washing the celery and radishes, which is a great comfort to the women in cold weather, and causes them to wash the celery better. There was a want of neatness about the whole garden, owing in a degree to its being surrounded by gasworks, lines of railway, land recently taken for building purposes, sewers, drains, and ditches. *Disjecta membra* of old machines and "fancy" implements were scattered about in some confusion, but the land itself was clean and well cultivated, and evidently was yielding a handsome return.

By dint of putting this and that fact together it was gathered that an average crop of radishes sown between the celery would make at least 28*l.* per acre: say 1100 dozen bunches at 6*d.* per dozen; and the celery, planted in the rows between the beds of radishes, would make from 50*l.* to 60*l.* per acre, taking an average of seasons: say from 1000 to 1200 bunches at 12*s.* per dozen bunches. Again, taking lettuces and celery together, an average crop of lettuces, grown as Mr. Lancaster grows them, would be worth about 30*l.* per acre. Or a crop of coleworts and cabbages grown with celery would be worth from 25*l.* to 30*l.* per acre, plus the value of the celery crop; so that even if the expenses amount to 40*l.* per acre, there is still a good margin of profit.

Mr. Lancaster grows his own seed, and is most particular in keeping his sorts distinct and true. He has improved his various kinds of vegetables by selection, by sowing the seed from the best plants with the required characteristics most strongly marked. His celery, as has been mentioned above, is of particular excellence, and is well known in the London markets. Being of a good type, and carefully prepared for market, it generally makes rather more money than that grown by other market-gardeners. The Judges were much struck with the energy and skill displayed in the management of this market-garden, as well as with the manifold indications of large profits made upon it. Much courage, capital, and ingenuity were required to change ordinary meadows in such a situation and with such surroundings into a garden of cucumbers—a very oasis in a wilderness of building land. The first prize in this class is well deserved by Mr. Lancaster, who has brought about this transformation. It should be mentioned, as a proof of the "culture" of market-gardeners, in Mr. Matthew Arnold's meaning of the term, that Mr. Lancaster has a large collection

of pictures, chiefly by old masters, some of which are valuable specimens of art.

Mr. Patch's Market-garden

is close to Barking, and is distant about seven miles from the Spitalfields Market, to which the greater part of its produce is consigned in waggons, which, as in most other cases, bring manure back. The soil is a light friable clay, on the London Clay formation, about 12 to 18 inches in thickness, resting upon beds of sand and small gravel, not good enough for road mending. It is somewhat more heavy in texture towards the southern part of the garden, and not of high class quality in any part; but it may be said to be grateful land, and costs Mr. Patch 520*l.* per annum for rent, rates, and taxes, or close upon 5*l.* 15*s.* per acre. Seven horses are kept, high-class animals, strong, active, and clean-legged, fitted for field and road work, and must have cost at least 70 guineas each. Horses are also occasionally hired in busy seasons. As to the profits made, the cost of labour, the annual average expenses of manure, and other incidentals, the Judges could form no very definite idea, for Mr. Patch does not "worry his head with figures," being too much occupied with the outdoor part of his business, and being "too tired at night to post up his account-books." They managed to glean, however, from conversation with him, that he was perfectly satisfied with the general results, and that his profits in some seasons and upon certain vegetables are very large, although it costs him 3000*l.* per annum, or rather more than 30*l.* for each acre, before he can touch a farthing of profit. From data furnished by other persons and from other sources, the Judges believe that the average expenses of market-garden land, cultivated in the ordinary manner, amount to 30*l.* per acre, taking an average of seasons. In some cases, however, as in that of Mr. Lancaster and his special culture of celery, the annual outlay per acre is much larger; but it must be admitted that 30*l.* per acre is a large sum, and that it requires great judgment, much forethought, energy, and practical knowledge, with continuous supervision of labourers, and personal labour also, to ensure success. Sometimes the seasons are utterly out of course, and, as in the last winter, spring, and summer, baffle the efforts of the most foreseeing and energetic. Constant frost destroyed a great part of the greenstuff, upon which the cultivators depend for much of their profit. Constant wet weather made weed-killing at least one-third more expensive than usual, and caused many of the seeds of such plants as scarlet-runners, French beans, marrows, and cucumbers to rot in the ground. Sometimes the

price of produce falls in a most sudden and disastrous manner, owing to a glut of particular vegetables, as in the early spring of 1878, when coleworts and cabbages, in consequence of the mild winter, were literally not worth carriage to London, and these crops were ploughed in on very many acres; while at the same date in the next year they were at famine prices. Occasionally a market-gardener, being a lucky individual, or blessed with a prophetic soul, makes a grand *coup* by having furnished his garden with a good supply of a commodity which few others have. "It is a good plan generally," said one fortunate competitor, "to plant that vegetable extensively of which there has happened to be a large quantity in the previous year. Nine men out of ten would be afraid to venture largely again for a time." This gentleman practised what he preached, and went in heavily for coleworts and cabbages in 1879, regardless of the losses upon them in 1878, and was reaping a rich reward for his sagacity.

Mr. Patch had some good coleworts and early York cabbages, which were making close to 90*l.* per acre, though they were neither so well grown nor so regular as others that were seen. At the first inspection of this garden the crops taken all round looked well, particularly some Fortyfold peas, got in early after scarlet-runners. The seed was dropped by hand into rows hoed out, which were filled with horse-hoof parings at the rate of one ton per acre. Both the autumn sown onions for bunching or drawing for sale in bunches in the spring, and those that had been sown in the spring for "bulbing" or for marketing as small or large bulbs in the summer or autumn, according to the demand, were fairly good, and the potatoes looked well. At the subsequent inspection the Judges were somewhat disappointed at the comparatively poor progress that some of the crops had made, due no doubt in a degree to the bad weather, as well as to some little neglect in getting the weeds checked. To kill these was perhaps almost out of the question, and to check them was a task worthy of Sisyphus, but others had tackled them a little more pluckily than Mr. Patch. Some of the potatoes were patchy, and the onions and carrots had lost plant. Slugs were suggested as the cause of the weakness of the carrots, but this soft impeachment was indignantly denied by Mr. Patch, who prides himself upon never having such beasts upon his land. The Judges imagined that they should then and there discover a great slug-preventing secret, but looking furtively into the hearts of the cabbages, where slugs love to lie, they saw enough to convince them that Mr. Patch is slug-blind.

Like other market-gardeners Mr. Patch has no systematic rotations of crops. His most usual method is to take winter

greens or cabbages first, then to follow with peas, scarlet-runners, parsnips, carrots, potatoes, and French beans. He grows more potatoes than is the practice generally, and most of these are early sorts, which he digs and sends to market as soon as possible, getting on an average about 4 tons 10 cwts. per acre. More than a fourth of his land was planted with potatoes this year.

Some idea of the rotation will be obtained from the following statement of the present cropping of Mr. Patch's land, and of the last crop, as far as could be ascertained :—

STATEMENT OF CROPS ON MR. PATCH'S MARKET-GARDEN.

Acreage.			Crop in 1879.	Previous Crop.
A.	R.	P.		
1	0	0	Beetroot and Mangels	Scarlet-runners.
0	2	0	French Beans	
5	0	0	Peas	
1	0	0	Parsley, Onions, Windsor Beans	
2	0	0	Scarlet-runners	Sprouting Broccoli.
4	0	0	Cabbage and Cauliflowers	
1	0	0	Red Cabbage and Lettuces	
1	0	0	Tares	Savoys & Hardy Greens.
3	0	0	Carrots	
2	0	0	Rhubarb	
2	0	0	Seed-bed	
4	0	0	Onions	
1	0	0	Fallow	Seed-beds.
4	0	0	Potatoes	Hardy Greens.
0	2	0	Rhubarb	
4	0	0	Parsnips	Hardy Greens and Early York Cabbages.
2	0	0	Cabbages	
2	0	0	Fallow	
2	0	0	Cucumbers	
10	0	0	Potatoes	
2	0	0	Onions	
2	0	0	Broad Beans	
1	0	0	Mangel	Potatoes.
9	0	0	Cabbages	Mangel.
5	0	0	Potatoes	
5	0	0	Wheat	Plants.
4	0	0	Marsh land	
2	0	0	Parsnips	Hardy Greens.
5	2	0	Potatoes	
3	0	0	Potatoes	

Considerable quantities of London manure are used upon this market-garden, but Mr. Patch has a special weakness for Ichaboe guano, which he applies to most crops at the rate of 3 or 4 cwts. per acre—the effect of which was not very apparent in some instances. He also uses nitrate of soda with good results for cabbages, putting it on in small quantities at frequent intervals. Horse-hoof parings and horn shavings are also favourite manures.

As to the quantity of manure used no definite conclusion could be arrived at, but it struck the Judges that the outlay for manure was not so large as upon other market-gardens which they had inspected.

Cucumbers and marrows are grown to some extent upon this market-garden. These are set in rows from 4 to 4½ feet apart. In most cases the seed is put at once into the ground, and it is exceptional to have transplanted plants. Mr. Patch sometimes "spears" the seed by putting it in damp flannels before it is sown. If the weather is warm, this answers well, but a low temperature afterwards will frequently arrest further vegetation. Between each row of cucumbers and marrows one drill of rye is set early in the spring, to serve as a shelter to the tender young plants against the wind. Strangers, seeing these solitary rows before the cucumbers and marrows have put in an appearance, wonder that they are set so wide apart, and think that the gardeners have taken a leaf out of the Lois Weedon system of corn-growing. These rows of rye are sometimes most prolific, and yield from 1½ to 2 qrs. per acre of corn. The marrows and cucumbers upon the land were very indifferent, like most of those that were seen by the Judges. Much of the seed had rotted, and the few plants that had struggled up were miserable specimens.

All the fences on this holding were good, and remarkably well kept by the tenant. Gates and buildings were in good order. Though the management of the land was not so thorough as that of Mr. Gay's in Class I., nor so original as Mr. Lancaster's, there was sufficient merit to warrant the Judges' recommendation that Mr. Patch should have the second prize.

Class III.

Market-Garden Farm.

The Market-garden Farm of the Trustees of the late J. C. Circuit. (*Manager, Henry Swann.*)

Many farmers in Essex, near London, grow vegetables most successfully in alternation with corn and other usual farm crops. They do not, as a rule, cultivate the smaller vegetables, nor herbs, nor salad stuff, but confine their attention mainly to cabbages, peas, onions, scarlet-runners, potatoes, carrots, parsnips, marrows, cucumbers, and French beans. Cabbages, coleworts, carrots, and onions are, however, chiefly grown. The soil here is not, in many respects, better suited for the growth of vegetables than that in many other parts of England. The proximity to the London markets, and the almost inexhaustible manure-

supply of the metropolis, with skilled labour at hand, give this district certain advantages over other localities; but there can be no reason why similar advantages should not be obtained in the vicinity of most other cities and towns.

The South Hall Market-garden Farm, to which the Judges awarded the first prize in this class, is one of a series of market-garden farms, amounting in all to 700 acres, situated in various parts of this district of Essex, and carried on by the Trustees of the late Mr. J. C. Circuit, for the benefit of his orphan Daughters, under the most able and judicious management of Mr. H. Swann.

Some idea of the magnitude of this business will be formed when it is stated that two traction engines and a set of Fowler's tackle are kept, and 900 hands and 70 horses are employed during the height of the season. There are shops for wheelwrights, carpenters, basket-makers, blacksmiths, and all the repairs are done; and waggons, vans, carts, and implements, as far as possible, are made on the premises. At least 30,000*l.* of capital must be required to carry the business on. Considerable skill and genius are necessary to manage 700 acres of ordinary land successfully. It requires an exceptional amount of genius and energy to work profitably 700 acres of land as a huge market-garden farm.

Everything was working well throughout its length and breadth. All was going smoothly as clockwork. No hurry; no confusion; no want of power in any direction could be observed. The crops were all in due season, and with singularly few exceptions were looking remarkably well in every part of each separate holding, and although the weather had been disastrously wet, the weeds had not been permitted to get the upper hand in any case.

South Hall Farm was selected by the Trustees of the late Mr. Circuit for this competition, and the Judges therefore had to deal with this alone so far as their ultimate award was concerned; but, in accordance with their instructions, they inspected all the other farms to satisfy themselves that the farm actually in competition was not deriving unfair advantage at their expense, and that they were not robbed in any way to benefit it. They were perfectly satisfied that there had not been any undue concentration of horse or hand labour upon South Hall, nor any extraordinary outlay for manure. On the contrary, it struck them that there were two or three of the other farms, especially one adjoining, that were even cleaner, and generally in a better condition than South Hall.

The soil upon the upper part of this farm is a kindly clay loam on the London Clay, of useful quality; it is somewhat

heavier in the lower part, near the marshes, and being closer upon the gravel has a tendency to burn. The rent is 3*l.* 10*s.* per acre, and rates, taxes, and tithes amount to 1*l.* 5*s.* per acre.

All the buildings are in capital order and most suitable, the majority having been recently put up; and the gates and fences were in a good state.

There are three enclosures of marsh land, which will fatten bullocks at the rate of from $1\frac{1}{4}$ to $1\frac{1}{2}$ per acre in ordinary seasons. Upon these were some very useful and well-bred Irish steers and heifers, that had been bought in March and were getting "smooth," though the season had been unfavourable for grazing. Near the homestead are some small meadows, which are fed and mown alternately. Two are useful pasture with fine herbage, lying high and dry; the other meadows are wet and marshy, and cannot be drained by reason of the level, and yield coarse grass. All the meadow land showed signs of care and attention, and was free from thistles and other weeds.

There is a more regular and definite rotation of crops upon this market-garden farm than was found in the case of market-gardens, though it is occasionally altered by circumstances and the seasons. It will be well to give here in some detail the scheme of cropping, which is adhered to as closely as possible upon South Hall Farm.

(1) Potatoes intended to come off in time to plant (2) cabbages in the autumn, to be taken off in the spring following and succeeded by (3) cucumbers, which stay only a few weeks upon the land, and give place to (4) winter onions. After these come (5) cabbages, then (6) potatoes, followed by (7) carrots or parsnips, (8) wheat, (9) oats, (10) broccoli, (11) potatoes or scarlet-runners, (12) coleworts, (13) peas, (14) Brussels sprouts, returning again to potatoes. This will show that the land is made to bring forth her increase continuously. Premising from the fine crops that were found upon it by the Judges, there has been no exhaustion of its resources; the great and constant drain upon these has been amply restored by liberal dressings of manure. Without these it would be impossible to work the land in this fashion. Quantities of nitrogenous manure are essential for the production of the brassicæ as well as of onions and carrots, whose plants thickly cover the ground, whose roots penetrate it in every direction with countless fibres. Much of the land of South Hall Farm, moreover, is peculiarly well fitted for the work of preparing the crude nitrogenous manures for assimilation by plants. Its mechanical condition and its power of absorption and retention of moisture make it well suited for this purpose. Its natural inherent fertility is

not of a more than average order. A happy combination of qualities renders it a most perfect medium for cramming vegetables. The natural fertility of a soil does not go far towards the production of, say, 1000 dozens of cabbages upon an acre, or 10 tons of onions, or other equally exhaustive crops; and the extraordinary results obtained from extraordinary applications of manure upon market-gardens and market-garden farms may teach all of us who are engaged in the cultivation of land not to put too much trust in the assumed "natural fertility" of land, in our ordinary farm management, and to use manures with more liberal hands.

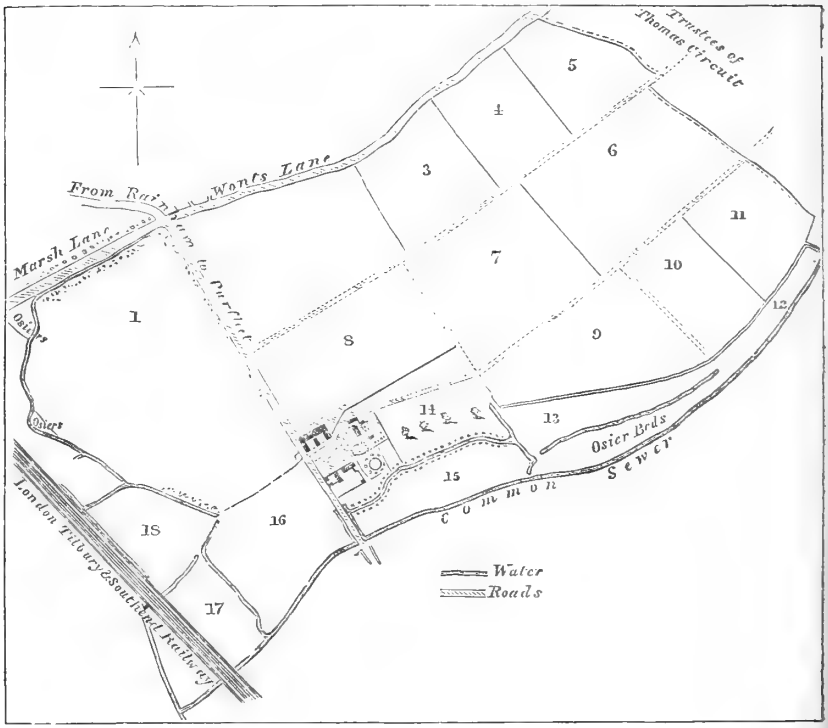
London manure, from stables and cowsheds, is put on for almost every crop, at the rate of from 25 to 30 tons per acre, not in its rough state, as it comes from London, but rotten and short; which means a thick coat, covering the ground completely. Refuse fish from the London fish-market is often brought back by the horses that have taken up vegetables, and is applied at the rate of from 5 to 8 tons per acre for summer crops. This costs about 1*l.* per ton, and is found to be a good stimulant, but not lasting. Horn-shavings are also used, and nitrate of soda to some extent, in cases where any crops show symptoms of flagging energies. Manure is applied with unsparing hands, as, from a statement furnished by Mr. Swann, it appears that the total sum expended upon this farm last year, ending at Christmas time, was 1178*l.*; or equal to 9*l.* 10*s.* per acre upon the 124 acres of arable land.

It will be convenient here to describe the state of each field upon this farm, with the crop upon it, and the mode of cultivation adopted. The number of each field corresponds with that given upon the accompanying map (p. 856) of South Hall Farm.

Upon field No. 1, 27 acres in extent, there was a magnificent display of East Ham cabbages, after cucumbers in one part, and onions in the other part of the field. These were planted in September, and 30 tons of London manure had been put on per acre. Nothing could be finer than these cabbages. Hardly a plant had missed, and their shape and quality were perfect. They were being packed off to market as fast as possible in huge spring vans, piled up in rows marvellously high, in two-horse loads of 190 dozens cabbages. "Red Bog" potatoes—a quick-growing, early-maturing sort—were being dibbled in between the rows of plants, the land having been kept mellow and in good order by the horse-hoe.* When the cabbages were removed, a narrow scarifier was put between the rows of potatoes, to cut up the old

* These potatoes were dug in August and sent to market, having been planted in June!

Fig. 2.—*South Hall Market-garden Farm, Rainham, Essex.*



1. Cabbages, 27 acres.
2. Carrots, 12 acres.
3. Wheat, 7 acres.
4. Peas, 5 acres.
5. Spouting Broccoli, to be followed with Scarlet-runners, 5½ acres.
6. Pickling Onions, 14½ acres.
7. Potatoes, 14 acres.
8. Carrots, 10 acres.
9. 6¼ acres.
10. Onion seed, 5 acres.
11. Mangold, 5¼ acres.
12. Wheat, 2½ acres.
13. Mangold, 4¾ acres.
14. Pasture.
15. Pasture.
16. Pasture.
17. Pasture.
18. Pasture.

roots and weeds that grew between. All the ground was then harrowed with light harrows, six in number, which cover 14 feet, attached to a long "wey-tree," or whipple-tree, with a horse hooked on at each end, driven by a man from behind with reins, who also clears the harrows when it is requisite. These are made at home, to suit the 4½-yard "lands," or stetches, that the horses may walk in the furrows instead of treading the land. When the ground is steam-ploughed, and there are no furrows, the horses are attached close together, so that the harrows may cover their feet-marks. These harrows can go with three "wey-trees," of different sizes, taking three, four, or six harrows.

When three harrows are used, one horse is required. Four require two light horses, and six want two strong animals. There were at least 1200 dozens of cabbages per acre upon this land, whose prices ranged from 6*s.* to 10*s.* per tally of 5 dozens; or, taking an average of 8*s.* per tally, equal to 96*l.* per acre. This, it must be remembered, is an exceptional price, caused by the scarcity at that time.

In the next field, No. 2, comprising 22 acres, were Early Horn and James's Intermediate carrots after potatoes. The land had been steam-ploughed in the autumn, and 28 tons of London manure put on in the early spring and "scuffled" in. About 10 lbs. of seed were sown broadcast, mixed with finely triturated earth. The carrots were intended for bunching, that is, for marketing when they are about half an inch in diameter, in bunches of from 20 to 40. Taking the last three years, the average return for carrots appears to be nearly 70*l.* per acre; but it is an expensive crop, for the hoeing costs 4*l.* per acre, and in ordinary seasons the expense of pulling, washing, and bunching, is also considerable. When the Judges visited the farm there was a hard fight going on to keep the weeds down. Some of these carrots had literally to be raked over with small-toothed iron rakes to get rid of the weeds. But this process did not materially affect the carrots, which looked remarkably thriving throughout. French Shaw potatoes upon No. 3, 14½ acres, looked most vigorous. These were after wheat, and were intended for early digging, and had been put in early in March. Twenty-eight tons of dung were ploughed in for this crop, just after Christmas. On the next field, 7 acres, No. 4, there was wheat of a sort called "Kissingen," a red wheat, with peculiarly stout, upstanding straw, which had been drilled in February, with 5 pecks of seed per acre, after parsnips, for which crop the land had been heavily dunged. The plant was decidedly thin, as it had had no chance to grow properly; but it had pulled up and wonderfully improved by the end of June, and looked all over like yielding 5 quarters per acre. Peas of the sort called Harrison's Glory, and the Yorkshire Hero, occupied No. 5 field; one bushel of seed was drilled here, after parsnips, and were most luxuriant. No. 6, containing 5 acres of scarlet-runners,* after broccoli, were doing very well, set in rows 3 feet apart. Upon No. 7 were 14 acres of "two-bladed" onions, which had succeeded cucumbers, the land having been steam-ploughed and manured with nearly 30 tons of dung, and 65 lbs. of seed were sown broadcast. These are small-bulbed onions, well suited for pickling, and many tons are sold by contract to Messrs.

* The first scarlet-runners were gathered about the 15th of August, or 6 weeks later than usual.

Crosse and Blackwell for this purpose. At each visit these onions were found to be remarkably free from weeds. Labourers usually engage to keep onions sown broadcast free from weeds for 4*l.* per acre. They could not manage this at anything like this money this season. When the onions are small they use two small tools, nearly a foot and a half long, which are so useful and unlike any known in other districts, that sketches of them are given. That shown in Fig. 3 is a short-handled hoe, a miniature of the ordinary-shaped tool. The other, represented in Figs. 4 and 4*a*, is styled a "knife," having a very short,

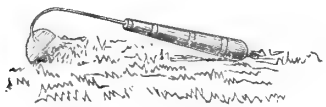


Fig. 3.

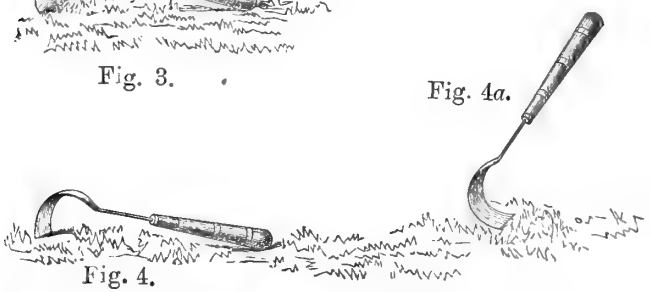


Fig. 4*a*.

Fig. 4.

curved, sharp blade, admirably adapted for "knifing" the weeds out of onions, carrots, and other plants set thickly. Both are used by men and women, either stooping or kneeling down, and serve admirably to cut up the weeds. When the onions get high, the men fasten coverings of sacking over their boots, that they may not bruise the plants, and go delicately upon their hands and knees. Their trail is seen for some hours after they have gone over the onions, and it takes them some time to recover and get upright again.

Pickling onions are a profitable crop if well farmed. In the course of their investigations in connection with this competition, the Judges had proof that an average amount of over 150*l.* per acre had been made for three years upon a very large acreage of onions. At the same time, the expenses of cultivation are enormous, and it requires exceptional skill and management to obtain such results, as well as judgment in making sale contracts. On No. 7 was a 7-acre piece of "Kissingen" wheat, put in about the middle of November, with 5 pecks of seed per acre, showing a strong and even plant, well forward, and looking like at least 6 quarters per acre. Part of this was after cabbage-plants, which had made 40*l.* per acre, having only occupied the ground about eight weeks, the seed having been sown in August, and

the plants taken up and sold in October. The crop previous to the cabbage-plants was carrots, cleared off by July for bunching, whose return was between 55*l.* and 65*l.* per acre. French Shaw potatoes were doing remarkably well upon 3 acres, No. 8. Osiers for bunching-twigs were growing on part of No. 9, which is 11 acres, and wheat upon the remaining portion. The land here lies so low that it had been under water from the heavy rains several times during the spring, so that the wheat plants were not in first-rate plight. Two-bladed onion-seed was growing and flourishing exceedingly upon 4½ acres, No. 10. Before this crop mangels had been taken which had yielded 60 tons per acre, and were sold at 1*l.* per ton, and had taken the first prize offered by Messrs. Carter, at the Brentwood Show, in 1878. There was a pretty good piece of mangels upon No. 11, 5 acres. The plants were not so thick as they might have been, but they were strong and luxuriant. Before these, scarlet-runners had been grown; the land was manured with 8 tons of fish refuse per acre for the mangel, and 6 lbs. of seed drilled in rows 18 inches apart, the plants being left 1 foot apart in the rows. There were no less than eight varieties of mangels in this field.

Taking the crops described above generally, they were very good, and promised to prove most remunerative, as from the appearance of many of the market-gardens and farms in the district, it seemed as if the weeds would prove too much for many fields of carrots, parsnips, and onions; while scarlet-runners and French beans had, in most instances, been injured by the weather.

The cost of labour upon this farm amounted to 14*l.* per acre upon the arable land, as an average of the past three years; or a total sum of 1736*l.* If the cost of manure is added to this, as given above, at 1178*l.*, or 9*l.* 10*s.* per acre, and the amount of rent, rates, and taxes, 4*l.* 15*s.* per acre, it will show a total sum of 28*l.* 5*s.* per acre; besides the cost of other items not enumerated, such as commission, seeds, baskets, and other incidentals. Large though this sum of the outgoings is, it is not at all disproportionate to that of the incomings. The most elaborate accounts that are kept of the whole business, in a strictly commercial style of double entry, were submitted to the Judges, who, if it were not a breach of confidence, could a tale unfold that would harrow up the souls of depressed farmers with unmitigated envy. From these accounts it was plainly shown that large profits had been made upon South Hall Farm, in common with all the other farms in the occupation of the Trustees of the late Mr. J. C. Circuit.

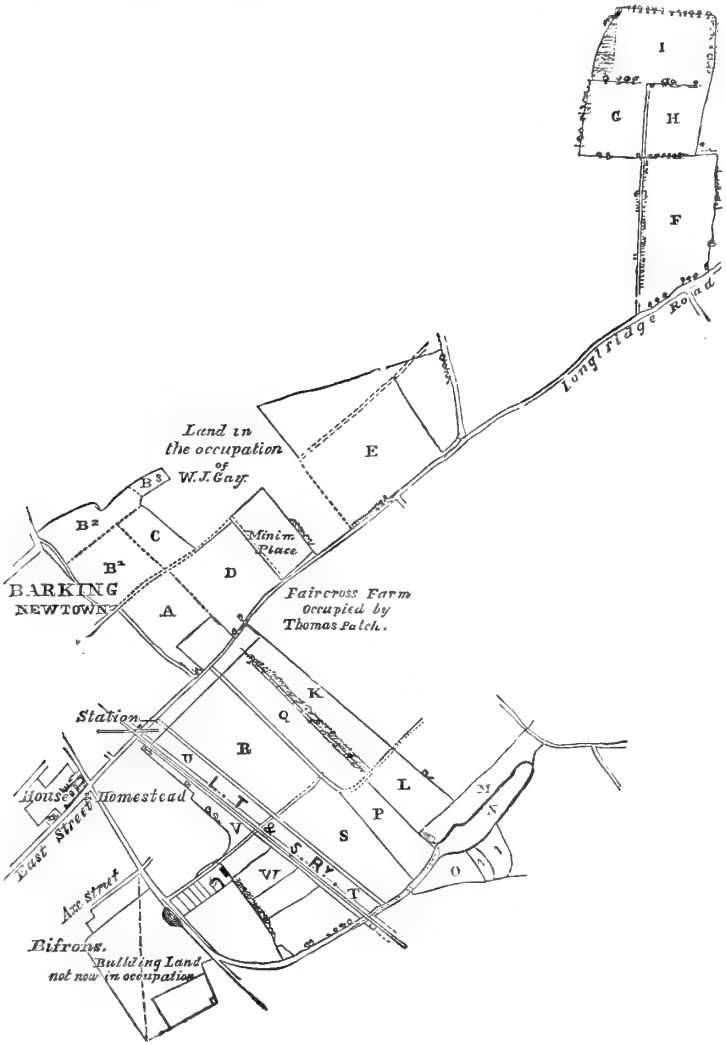
Mr. Glenny's Market-garden Farm.

This is another good specimen of a market-garden farm, and is illustrative of a judicious and liberal outlay of capital, and of skill in arranging the sequences of crops, and in carrying out the details in connection with their thorough cultivation. The extent of Mr. Glenny's holding is 208 acres, consisting almost entirely of arable land. It may be thought that the management of 208 acres would not greatly exercise a man's brains, nor require particular judgment and knowledge; but this opinion would not be held for one moment by any one who realised the amount of forethought necessary to plan the rotation of crops of vegetables in alternation with corn, the close, careful supervision requisite to ensure the best possible return, and the amount of capital involved.

To begin with, the annual average cost of manual labour is 2300*l.*, or 11*l.* 4*s.* per acre, per annum. Rent ranges between 3*l.* and 3*l.* 10*s.*, and rates, tithes, and taxes amount to from 1*l.* 5*s.* to 1*l.* 7*s.* per acre. Putting all expenses together, the total cost per acre is about 25*l.* per annum. It will be observed that this is not so high as in the case of market-gardens, nor as in that of South Hall Market-garden Farm, in competition with Mr. Glenny's entry, and the explanation of this is that more wheat and potatoes are growing upon the latter, and the part that lies nearly a mile from the homestead is farmed more as ordinary farm land. The fact that the cost of manure per acre over the whole farm was under 2*l.* 10*s.* per acre confirms this.

The soil is a clay or loamy clay of medium quality, upon the London Clay formation, and works fairly well. It is from 3 to 4 feet in thickness, and rests upon a gravelly subsoil. Geographically, it lies in three divisions—one near Mr. Glenny's house and homestead, in the town of Barking; another a mile away to the north-east; and the third half a mile south of Barking. This last portion of the land is devoted chiefly to the production of those vegetables usually grown by market-gardeners. That lying at a little distance from the homestead is cropped with corn to some extent, in alternation with vegetables; while upon the most distant division, wheat, oats, potatoes, and mangels are the main productions. For example, the usual rotation here is wheat, oats, potatoes or mangels, with a good dressing of London manure for the potatoes. Upon the land nearest home, cabbages, savoys, parsnips, and potatoes are taken, or four crops in three years, for which two dressings of London manure are given. As Mr. Glenny pointed out, the rotations upon these three divisions are liable to frequent variations consequent upon

Fig. 5.—*Mr. W. W. Glenny's Market-garden Farm, Barking, Essex.*



weather, the state of the markets, and other contingencies. At the time of the first inspection of the Judges, Mr. Glenny was marketing quantities of well grown East Ham cabbages, with solid hearts. The crop was above the average, and the prices made of them were most remunerative. In the second week of June, autumn-sown Lisbon onions were being sent to market from a large field in the second division of the farm, upon which there was an abundant yield. These were sent up to London in bunches containing as much as a man could hold in both his hands. The bunches are spread out in a fan-like shape, and packed in layers in baskets, which are piled up on large strong waggons or vans with springs built to carry a weight of 5 tons and upwards. There must have been at least 350 dozen bunches per acre on this piece of land, and the gross return from them was, as far as could be ascertained, between 60*l.* and 70*l.* per acre. After the onions had been all marketed, peas, carrots, and broad beans soon would have been ready for market, if the weather had been favourable. As it was cold and wet there was an unusual hiatus of some weeks, during which there was but little for market. After the peas, carrots, and beans were ended, early or "young" potatoes would come on, for Mr. Glenny, like other market-gardeners and market-garden farmers, does not clamp any potatoes, but digs and sells them directly they are ready. Scarlet-runners, French beans, marrows, and cucumbers would follow in rapid succession.

By the preceding map (p. 861) of Mr. Glenny's land, it will be seen that it does not lie together, nor conveniently for working; and there is much consequent disadvantage and increase of expense in respect of supervision, cartage of vegetables and other produce, as well as of manure.

The following table (p. 863) gives the letter of each field, corresponding with those upon the map, and shows the rotation of crops for the past three years:—

All the wheat-plant upon B^1, E, and F, was promising, especially that upon B^1, which was a remarkably healthy piece of 4 acres, with a full and even plant. There was not quite so much plant upon F, after potatoes, and in places it was inclined to be thin and patchy in May, but it had filled up and improved marvellously by the end of June, and the ears were beginning to show. It was considered that there was a prospect of at least $5\frac{1}{2}$ qrs. of wheat per acre all round upon this farm; there was straw enough to grow 6 qrs. all round. The wheat had followed potatoes and mangel, for which the land had been heavily dunged, and 5 pecks of seed had been drilled per acre towards the end of November, the land having been ploughed up directly the previous crop had been removed. It is not

customary to put wheat in before the middle of November in this part of Essex, as it is apt to get "winter proud" if it is sown earlier. Mr. Glenny grows a sort of wheat called "Tall Straw," a red wheat with stout stiff straw, that seemed closely allied to the "Kissingen" wheat, grown upon the farm of the Trustees of the late Mr. J. C. Circuit.

Number of Field.	Description of Crop in		
	1877.	1878.	1879.
A.	Parsnips	Onions. Scarlet-runners	Cabbages.
B^1.	Lisbon onions	Mangel	Wheat.
B^2.	——	Wheat	Windsor beans.
B^3.	Willow-bed	Willow-bed	Willow-bed.
C.	Early potatoes, followed by turnips	Wheat	Early potatoes.
D.	Potatoes	Cucumbers	Early greens, varieties to follow.
E.	Wheat, and peas, and beans	Potatoes	Cabbages, peas, potatoes, onions, wheat.
F.	Oats	Potatoes	Wheat.
G.	Wheat	Wheat (as an experiment)	Potatoes.
H.	Potatoes	Wheat	Oats.
I.	Potatoes	Oats and wheat	Mangel and seed-bed.
K.	Parsnips	Potatoes	Cabbages.
L.	Early Shaws and parsnips	Wheat and onions	Cucumbers and red cabbages.
M.	——	Onions	Parsnips.
N.	Pasture	Pasture	Pasture.
O.	——	Wheat	Rye cut green, then mangel.
P.	Cabbages	Parsnips	Onions.
Q.	Potatoes	Cabbages	Onions.
R.	Parsnips and cucumbers	French beans, cabbage, and mangel	Onions, cabbages, tares, beetroot.
S.	——	Onions, rhubarb, and beetroot	Rhubarb, carrots, cabbage,
T.	Lisbon onions	Parsnips	Potatoes.
U.	Potatoes	Red cabbage	Parsnips.
V.	——	Rhubarb and lucerne	Rhubarb and lucerne.
W.	——	——	Peas, scarlet-runners.

It would have been difficult to find a more luxuriant piece of oats than that upon H field; there was quite plant enough to yield 12 qrs. per acre, and withal it looked sturdy and strong, and as if it would not go down under any circumstances—and after wheat too!—a liberty which Mr. Glenny can afford to take with his land successfully, as he said, and of which the Judges had proof positive in this instance. For the potato crop in 1877, the land had been heavily dunged; then came the wheat without manure in 1878, and the oats without manure in 1879. Nitrate of soda would have been applied if the oats had shown

any symptoms of flagging energies. They were "Lincolnshire Polands," drilled early in March, the wheat stubble having been smashed up in the autumn by a steam cultivator. Potatoes are generally planted immediately after the plough on this farm, and the seed is put into every other furrow, or about 18 inches from row to row. The seed is dibbled in by hand, at a distance of 15 inches apart in the rows. After the seed has been planted the furrows are harrowed down. When the Judges saw the potato land, early in May, it seemed to them to lie somewhat roughly and unevenly; the furrows in some places had not been thoroughly broken down, and the marks of the horses' hoofs had not been harrowed out. Probably it had been difficult to work the land properly on account of its wet unkindly state; but when the Judges saw the potato ground in June, after the rows of plants had been earthed up by the mould-plough, no fault could be found with the tillage. Red Bogs, Champions, and Dalmahoys, are the sorts principally planted: the seed, as a rule, comes from Scotland. Though potatoes are cultivated in frequent succession upon this farm, as well as upon many of the farms and gardens in this part of Essex, the injury and loss from the potato-blight are comparatively inconsiderable, and the immunity, or comparative immunity, from blight is due to the fact that early potatoes are planted for the most part, and are dug, as early as possible, and therefore escape the blight, which is not usually developed, or at all events does not seriously affect the tubers, until late in the season. Mr. Glenny was trying a new sort of potato, the Schoolmaster. Though it is a capital sort, he feared that it would not be adapted for field-culture, as the haulm was not strong and vigorous.

The peas in the field marked E bade fair to give a most productive yield; they were somewhat backward, like all the peas this season. The Fortyfold, Fillbasket, William the First, and Dr. Maclean are the sorts usually sown on this farm. Near the homestead was a very fine show of Broad Windsor beans, for podding, which were set 18 inches apart and earthed up like potato plants to protect the stems and keep them standing erect. Mr. Glenny grows scarlet-runners to a considerable extent. Owing to the inclement season he had been obliged to plough up some acres, as the seed had rotted in the ground. Scarlet-runners are planted towards the end of April, from 10 to 14 inches distant in the drills, which are at least 3 feet apart. No sticks, nor supports of any kind, are put to the scarlet-runners, and the plants are kept low by having their tops cut off two or three times in their early stages, which in some degree alters their habit and tends to make them more productive. French beans are not planted so far apart, and are more delicate than "run-

Royal Agricultural Society of England.

1879.

President.

H.R.H. THE PRINCE OF WALES, K.G.

Trustees.

Year when Elected.	
1855	ACLAND, Sir THOMAS DYKE, Bart., M.P., *Sprydoncote, Exeter, Devonshire.*
1857	BRIDPORT, General Viscount, *Cricket St. Thomas, Chard, Somersetshire.*
1850	CHESHAM, Lord, *Latimer, Chesham, Bucks.*
1861	DENT, J. D., *Ribston Hall, Wetherby, Yorkshire.*
1863	KINGSCOTE, Colonel, M.P., *Kingscote, Wotton-under-Edge, Gloucestershire.*
1868	LICHFIELD, Earl of, *Shugborough, Staffordshire.*
1854	MACDONALD, Sir ARCHIBALD KEPPEL, Bt., *Woolmer Lodge, Liphook, Hants.*
1860	MARLBOROUGH, Duke of, K.G., *Blenheim Park, Oxford.*
1839	PORTMAN, Viscount, *Bryanston, Blandford, Dorset.*
1856	POWIS, Earl of, *Powis Castle, Welshpool, Montgomeryshire.*
1858	RUTLAND, Duke of, K.G., *Belvoir Castle, Grantham, Leicestershire.*
1861	WELLS, WILLIAM, *Holmewood, Peterborough, Northamptonshire.*

Vice-Presidents.

1873	BEDFORD, Duke of, *Woburn Abbey, Bedfordshire.*
1861	CATHCART, Earl, *Thornton-le-Street, Thirsk, Yorkshire.*
1839	CHICHESTER, Earl of, *Stanmer Park, Lewes, Sussex.*
1867	DEVONSHIRE, Duke of, K.G., *Holker Hall, Lancashire.*
1847	EVERSLEY, Viscount, *Heckfield Place, Winchfield, Hants.*
1848	GIBBS, Sir BRANDRETH, *Halfmoon Street, Piccadilly, London, W.*
1858	KERRISON, Sir EDWARD C., Bart., *Brome Hall, Scole, Suffolk.*
1848	LAWES, JOHN BENNET, *Rothamsted, St. Albans, Herts.*
1852	RICHMOND AND GORDON, Duke of, K.G., *Goodwood, Chichester, Sussex.*
1872	SKELMERSDALE, Lord, *Lathom Hall, Ormskirk, Lancashire.*
1859	VERNON, Lord, *Sudbury Hall, Derby.*
1855	WYNN, Sir WATKIN WILLIAMS, Bart., M.P., *Wynnstay, Ruabon, Denbighshire.*

Other Members of Council.

1858	AMOS, CHARLES EDWARDS, 5, *Cedars Road, Clapham Common, Surrey.*
1877	ARKWRIGHT, J. H., *Hampton Court, Leominster, Herefordshire.*
1875	AVELING, THOMAS, *Rochester, Kent.*
1875	AYLMER, HUGH, *West Dereham, Stoke Ferry, Norfolk.*
1863	BOWLY, EDWARD, *Siddington House, Cirencester, Gloucestershire.*
1861	CANTRELL, CHARLES S., *Riding Court, Datchet (Bucks), Windsor.*
1874	CHANDOS-POLE-GELL, H., *Hopton Hall, Wirksworth, Derbyshire.*
1878	DAVIES, DAVID REYNOLDS, *Agden Hall, Lymm, Cheshire.*
1860	DRUCE, JOSEPH, *Eynsham, Oxford.*
1868	EDMONDS, WILLIAM JOHN, *Southrop, Lechlade, Gloucestershire.*
1871	EGERTON, Hon. WILBRAHAM, M.P., *Rostherne Manor, Knutsford, Cheshire.*
1873	EVANS, JOHN, *Uffington, Shrewsbury, Salop.*
1876	FEVERSHAM, Earl of, *Duncombe Park, Helmsley, Yorkshire.*
1879	FOSTER, S. P., *Killhow, Carlisle, Cumberland.*

Year when Elected.	
1875	FRANKISH, WILLIAM, *Limber Magna, Ulceby, Lincolnshire.*
1874	HEMSLEY, JOHN, *Shelton, Newark, Notts.*
1876	HOWARD, CHARLES, *Biddenham, Bedford.*
1878	HOWARD, JAMES, *Clapham Park, Bedfordshire.*
1871	JONES, J. BOWEN, *Ensdon House, Montford Bridge, R.S.O., Salop.*
1869	LEEDS, ROBERT, *Keswick Old Hall, Norwich.*
1872	LEICESTER, Earl of, K.G., *Holkham Hall, Wells, Norfolk.*
1874	LINDSAY, Colonel LOYD, M.P., *Lockinge Park, Wantage, Berkshire.*
1865	LOPES, Sir MASSEY, Bart., M.P., *Maristow, Roborough, Devon.*
1871	MCINTOSH, DAVID, *Havering Park, Romford, Essex.*
1874	MARTIN, JOSEPH, *Highfield House, Littleport, Isle of Ely, Cambridgeshire.*
1871	MASFEN, R. HANBURY, *Pendeford, Wolverhampton, Staffordshire.*
1879	NEVILLE, ROBERT, *Butleigh Court, Glastonbury, Somersetshire.*
1878	ODAMS, JAMES, *The Grange, Bishop Stortford, Herts.*
1857	PAIN, THOMAS, *The Grove, Basingstoke, Hants.*
1861	RANDELL, CHARLES, *Chadbury, Evesham, Worcestershire.*
1875	RANSOME, ROBERT CHARLES, *Ipswich, Suffolk.*
1867	RAVENSWORTH, Earl of, *Ravensworth Castle, Durham.*
1871	RAWLENCE, JAMES, *Bulbridge, Wilton, Salisbury, Wilts.*
1869	RIDLEY, Sir M. WHITE, Bart., M.P., *Blagdon, Cramlington, Northumberland.*
1861	RIGDEN, WILLIAM, *Ashcroft, Kingston-by-Sea, Shoreham, Sussex.*
1875	RUSSELL, ROBERT, *Horton Court Lodge, Dartford.*
1874	SANDAY, GEORGE HENRY, *Wensley House, Bedale, Yorkshire.*
1878	SHERATON, WILLIAM, *Broom House, Ellesmere, Salop.*
1856	SHUTTLEWORTH, JOSEPH, *Hartsholme Hall, Lincoln.*
1874	SPENCER, Earl, K.G., *Althorpe, Northampton.*
1875	STRATTON, RICHARD, *The Duffryn, Newport, Monmouthshire.*
1873	TOBE, JOHN, M.P., *Carlett Park, Eastham, Cheshire.*
1874	TURBERVILL, Lieut.-Col. PICTON, *Ewenny Priory, Bridgend, South Wales.*
1845	TURNER, GEORGE, *Great Bowley, Tiverton, Devonshire.*
1871	TURNER, JABEZ, *Norman Cross, Yaxley, Huntingdonshire.*
1871	WAKEFIELD, WILLIAM H., *Sedgwick, Kendal, Westmoreland.*
1870	WELBY-GREGORY, Sir WILLIAM EARLE, Bart., M.P., *Denton Hall, Grantham, Lincolnshire.*
1870	WHITEHEAD, CHARLES, *Barming House, Maidstone, Kent.*
1865	WILSON, JACOB, *Woodhorn Manor, Morpeth, Northumberland.*
1878	WISE, GEORGE, *Woodcote, Warwick.*

Secretary and Editor.

H. M. JENKINS, 12, *Hanover Square, London,* **W.**

Consulting Chemist—Dr. AUGUSTUS VOELCKER, F.R.S., 12, *Hanover Square,* **W.**
Consulting Botanist—W. CARRUTHERS, F.R.S., F.L.S., *British Museum,* **W.C.**
Consulting Veterinary Surgeon—Professor JAMES BEART SIMONDS, *Royal Veterinary College, Camden Town,* **N.W.**
Veterinary Inspectors—THE OFFICERS OF THE ROYAL VETERINARY COLLEGE.
Consulting Engineers—EASTONS & ANDERSON, 3, *Whitehall Place,* **S.W.**
Surveyor—GEORGE HUNT, *Evesham, Worcestershire.*
Seedsmen—THOMAS GIBBS and Co., *Corner of Halfmoon Street, Piccadilly,* **W.**
Publisher—JOHN MURRAY, 50, *Albemarle Street,* **W.**
Bankers—THE LONDON AND WESTMINSTER BANK, *St. James's Square Branch,* **S.W.**

STANDING COMMITTEES FOR 1879.

Finance Committee.

Kingscote, Colonel (Chairman).
Bridport, General Viscount.
Ridley, Sir M. White, Bt.
Davies, D. R.
Frankish, W.
Randell, Charles.
Shuttleworth, J.

House Committee.

The President.
Chairman of Finance Committee.
Bridport, General Viscount.
Gibbs, Sir Brandreth.
Cantrell, C. S.
Kingscote, Colonel.

Journal Committee.

Dent, J. D. (Chairman).
Cathcart, Earl.
Welby-Gregory, Sir W. E., Bt.
Ridley, Sir M. White, Bt.
Chandos-Pole-Gell, H.
Frankish, W.
Hemsley, J.
Howard, J.
Jones, J. Bowen.
Kingscote, Colonel.
Ransome, R. C.
Turbervill, Lieut.-Col.
Wells, W.
Whitehead, Charles.
Wise, G.

Chemical Committee.

Wells, William (Chairman).
Bedford, Duke of.
Lichfield, Earl of.
Vernon, Lord.
Macdonald, Sir A. K., Bart.
Welby-Gregory, Sir W. E., Bt.
Arkwright, J. H.
Aveling, T.
Carruthers, W.
Dent, J. D.
Edmonds, W. J.
Howard, C.
Jones, J. Bowen.
Lawes, J. B.
Tubervill, Lieut.-Col.
Voelcker, Dr. A.
Wakefield, W. H.
Warren, R. A.
Whitehead, Charles.

Seeds and Plant-Diseases Committee.

Vernon, Lord.
Welby-Gregory, Sir W. E., Bt.
Gibbs, Sir Brandreth.
Arkwright, J. H.
Carruthers, W.
Frankish, W.
Jones, J. Bowen.
Turbervill, Lieut.-Col.
Voelcker, Dr.
Whitehead, Charles.

Veterinary Committee.

Egerton, Hon. Wilbraham (Chairman).
Cathcart, Earl.
Bridport, General Viscount.
Ridley, Sir M. White, Bt.
Gibbs, Sir Brandreth.
Brown, Professor.
Chandos-Pole-Gell, H.
Davies, D. R.
Duguid, W.
Fleming, George.
Greenfield, Dr. Wm. Smith.
Harpley, M. J.
Kingscote, Colonel.
Odams, James.
Sanday, G. H.
Sanderson, Dr. J. Burdon.
Simonds, Professor.
Wakefield, W. H.
Wells, William.
Wilson, Jacob.

Stock-Prizes Committee.

Spencer, Earl.
Bridport, General Viscount.
Gibbs, Sir Brandreth.
Arkwright, J. H.
Aylmer, H.
Bowly, Edward.
Chandos Pole-Gell, H.
Davies, D. R.
Evans, John.
Frankish, W.
Hemsley, J.
Howard, C.
McIntosh, D.
Masfen, R. H.
Pain, T.
Sanday, G. H.
Sheraton, W.
Simonds, Prof.
Stratton, R.
Torr, J.
Turner, Geo.
Wakefield, W. H.
Wilson, Jacob.
Wise, G.
The Stewards of Live Stock.

Implement Committee.

Hemsley, J. (Chairman).
Bridport, Gen. Viscount.
Vernon, Lord.
Gibbs, Sir Brandreth.
Anderson, W.
Aveling, T.
Cantrell, Chas. S.
Edmonds, W. J.
Frankish, W.
Howard, J.
Jones, J. Bowen.
Martin, J.
Ransome, R. C.
Sanday, G. H.
Sheraton, W.
Shuttleworth, Joseph.
Simonds, Prof.
Stratton, R.
Turbervill, Lieut.-Col.
Turner, Jabez.
Whitehead, Charles.
Wilson, Jacob.
The Stewards of Implements.

General London Exhibition Committee.

Kingscote, Col. (Chairman).
Bridport, Gen. Viscount.
Chesham, Lord.
Grosvenor, Lord R.
Skelmersdale, Lord.
Egerton, Hon. W.
Gibbs, Sir Brandreth.
Allender, G. M.
Aveling, T.
Aylmer, H.
Bowly, E.
Cantrell, Charles S.
Chandos-Pole-Gell, H.
Davies, D. R.
Frankish, W.
Gilbey, Walter.
Hadley, Alderman.
Hambro, Charles.
Howard, C.
Hemsley, J.
Jones, J. Bowen.
McIntosh, D.
Martin, J.
Masfen, R. H.
Mayor, The Rt. Hon. the Lord.
Pain, T.
Randell, Charles.
Ransome, R. C.
Rawlence, J.
Russell, R.
Sanday, G. H.
Shuttleworth, J.
Simonds, Professor.
Soulsby, W. J.
Staples, Alderman and Sheriff.
Stratton, R.
Turbervill, Lieut.-Col.
Turner, Jabez.
Wakefield, W. H.
Wells, W.
Whitehead, Charles.
Wilson, Jacob.

Show-Yard Contracts Committee.

Wilson, Jacob (Chairman).
Bridport, General Viscount.
Gibbs, Sir Brandreth.
Amos, C. E.
Aveling, T.
Chandos-Pole-Gell, H.
Frankish, W.
Hemsley, J.
Howard, C.
Randell, Charles.
Shuttleworth, Joseph.
Stratton, R.

Committee of Selection.

Cathcart, Earl (Chairman).
Bridport, General Viscount.
Chandos-Pole-Gell, H.
Dent, J. D.
Hemsley, J.
Kingscote, Colonel.
Wilson, Jacob.

And the Chairmen of the Standing Committees.

Education Committee.

Bedford, Duke of (Chairman).
Aveling, T.
Carruthers, W.
Dent, J. D.
Jones, J. Bowen.
Kingscote, Colonel.
Turbervill, Lieut.-Col.
Voelcker, Dr.
Whitehead, Charles.
Wise, G.

Cattle Plague Committee.

The whole Council.

*** The President, Trustees, and Vice-Presidents are Members *ex officio* of all Committees.

Royal Agricultural Society of England.

GENERAL MEETING,

12, Hanover Square, Wednesday, December 12th, 1878.

REPORT OF THE COUNCIL.

The Council have to report that during the year 1878 the number of Governors and Members has been increased by the election of 4 Governors and 451 Members, and diminished by the death of 5 Governors and 110 Members, and the removal of 183 Members by order of the Council and by resignation.

The Society now consists of:—

79 Life Governors,
73 Annual Governors,
2377 Life Members,
4242 Annual Members,
26 Honorary Members,

making a total of 6797, and showing an increase of 157 Members during the current year.

The Council announce with deep regret the death of their most valued colleagues, Sir William Miles, Bart., a Vice-President, and Mr. T. C. Booth, of Warlaby, Northallerton, a Member of the Council. They have also to report the resignation of Mr. Milward, of Thurgarton Priory, Notts, as a Trustee of the Society.

The vacancies thus caused have been filled up by the election of Mr. Wells, of Holmewood, Peterborough, as a Trustee, of Lord Skelmersdale as a Vice-President, and of Mr. D. R. Davies, of Agden Hall, Lymm, Cheshire, as a Member of the Council.

The half-yearly statement of accounts to the 30th of June last has been examined and approved by the Society's auditors and accountants, and has been published for the information of the Members in the last number of the 'Journal.' The funded

property of the Society remains the same as at the last General Meeting, namely, 26,511*l.* 11*s.* 5*d.* New Three per Cents. The balance of the current account in the hands of the Bankers on the 1st instant was 942*l.* 19*s.* 10*d.*, and the sum of 1000*l.* remained on deposit.

The Bristol Meeting was in every respect highly satisfactory. The entries of Live Stock and Implements were very large, the attendance of the public was good, and the result to the Society profitable. The visit of His Royal Highness the Prince of Wales gave the citizens their long-wished-for opportunity of showing their loyalty, while the Mayor of Bristol, the Local Committee, and the Merchant Venturers, vied with each other in their hospitality to the Society. The trials of Dairy Appliances were most successfully carried out in the Showyard, and were daily watched with interest by numbers of dairy-farmers and others. The trials of the Sheaf-binders which competed for the Society's Gold Medal took place at harvest-time on Mr. Miles's farm at Leigh, near Bristol, and resulted in the award of the Gold Medal to Messrs. Waite, Burnell, and Co., for McCormick's Sheaf-binder, the Binder exhibited by Mr. Walter A. Wood being highly commended.

The Prizes offered by the Local Committee for Arable and Dairy Farms attracted only 3 competitors in the former class, but as many as 15 in the latter. The Reports on this competition, on the trials of Sheaf-binders and Dairy Appliances, and on the exhibition of Stock and Implements, will be published in the forthcoming number of the 'Journal.'

In connection with the Paris Universal Exhibition, an Agricultural Congress, at which the Society was influentially represented, was held at the Palace of the Trocadéro. At the desire of the Society of French Agriculturists, the Council caused a memoir on English Agriculture to be prepared and laid before the Congress. That memoir has since been issued to the Members of the Society in lieu of the usual autumn number of the 'Journal,' and the Council believe that this proceeding has met with general approval.

The preparations for next year's Meeting of the Society, which will assume the form and proportions of an International Agricultural Exhibition, are in active progress. A very convenient site at Kilburn, 100 acres in extent, has been obtained

from the Ecclesiastical Commissioners, whose agents have shown themselves most desirous of furthering the objects of the Society. The land selected is situated between the London and North-Western and the North London Railways, and adjoins the new Salusbury Road station on the former, and the Kensal Green station on the latter line. It is three-quarters of a mile from the West End station on the Midland Railway, the same distance from the Westbourne Park station on the Great Western Railway, and two miles and a half from the Marble Arch.

The Prize-sheet will contain classes for all the distinctive breeds of English Horses, Cattle, Sheep, and Pigs, and also for the distinctive breeds of Foreign Stock from countries which are not prohibited by any Orders in Council issued under the Contagious Diseases (Animals) Act, 1878. Prizes will also be offered for Asses, Mules, Goats, Butter, Cheese, Wool, Hops, Seed-corn, and Meat. The Shorthorn Society have offered Prizes for Foreign Shorthorns; the Hop-growers have offered the Prizes for English-grown Hops, and the Mansion House Committee have offered the Prizes for Foreign Stock and Produce.

The Mansion House Committee have also offered handsome Prizes for Sewage Farms and Market Gardens, and the Council are glad to report that there will be a fair competition in all the classes.

In addition to the exhibition of British and Foreign Implements, Live Stock, and Produce, it is proposed to enhance the interest and the instructiveness of the Meeting by showing some of the processes of Foreign dairying in actual progress in the enclosure, as well as Traction-engines and Automatic Implements in action. It is also proposed to exhibit side by side representatives of ancient and of modern Farm Implements and Machines, which the Council trust will be lent by their possessors for the purpose, and thus aid in the comprehension of the great advance which has been made by Agricultural Machinery during the forty years which have elapsed since the Society was established.

The Exhibition will commence on Monday, June 30th, and will close on Monday evening, July 7th.

The district assigned for the Country Meeting of 1880 includes the counties of Northumberland, Durham, Cumberland,

and Westmoreland; and the Council have already received a pressing invitation for that year from the Mayor and Corporation of Carlisle.

During the past year the Legislature have amended the law relating to the Contagious Diseases of Animals of the Farm, giving additional protection against the importation of such diseases with Foreign Animals, and securing greater uniformity of action amongst Local Authorities in the event of outbreaks within the United Kingdom. The Council have continually urged the necessity of adopting measures based on these principles, and they trust that the recent Act, and the Orders of the Privy Council based upon it, will not only prevent to a great extent those losses which English farmers have hitherto suffered from the outbreaks of contagious diseases amongst their flocks and herds, but also enable them to increase their stock profitably, on account of the diminished risk which breeding on an extended scale will henceforth entail.

The experiments upon Pleuro-pneumonia have been continued during the greater part of the year at the Brown Institution, under the superintendence of Dr. Burdon-Sanderson, whose complete Report will appear in the next number of the 'Journal.' Very valuable indications have been obtained, but unfortunately one of the provisions of the new Contagious Diseases (Animals) Act prevents the further continuance of these investigations. With the sanction of the Council, Dr. Burdon-Sanderson has commenced a series of researches into such diseases as Splenic Apoplexy and Quarter-evil, the nature and causes of which are at present more or less obscure.

The experiments at Woburn are being continued on the plan originally laid down, and Dr. Voelcker's Report on the results obtained during the past year will appear in the next number of the 'Journal.' Further experiments on feeding stuffs have also been commenced, and the utilization of a portion of Crawley Farm for experimental purposes is in contemplation.

As reported at the last Annual Meeting, the Council have decided to furnish the Consulting Chemist with a laboratory and all its adjuncts, so as to reduce the fees for analysis to be charged to the Members of the Society to about one-half their present amounts. The structure of the laboratory is now finished, and the Council expect that the fittings will shortly

be in place, so that the operation of the new scheme will commence with the approaching year. The advantages thus offered to Members of the Society are so great, that the Council confidently expect them to attract a large accession to the roll of Members.

Twenty-nine candidates were entered for examination for the Society's Junior Scholarships from the following schools :— Aspatria Agricultural School (4), Bedford County School (2), Devon County School (2), Glasnevin College (1), Sandbach Grammar School (4), and Surrey County School (16). The following candidates, arranged in order of merit, have gained Scholarships :—

1st.	C. CALDECOTT	Surrey County School.
2nd.	F. WYLES	
3rd.	R. P. CHOPE	Devon County School.
4th.	J. ROCHE	Glasnevin College.
5th.	A. J. WAGHORN ..	Surrey County School.
6th.	B. FURNIVAL	
7th.	J. RIGBY	Sandbach School.
8th.	J. HAYNES	Devon County School.
9th.	T. LEESE	Sandbach School.

Four candidates have entered to compete for the Society's Medals and Prizes offered to Veterinary Surgeons of not more than fifteen months' standing, for proficiency in Cattle Pathology, and the examination will be held at the Royal College of Veterinary Surgeons in the course of the ensuing month.

By order of the Council,

H. M. JENKINS,

Secretary.

Royal Agricultural Society of England.

1879.

DISTRIBUTION OF MEMBERS OF THE SOCIETY AND OF MEMBERS OF COUNCIL.

Districts.	Counties.	Number of Members.	Number in Council.	Members of Council.
A.	Bedfordshire ..	75 ..	3	Duke of Bedford, v.p.; C. Howard; James Howard.
	Buckinghamshire ..	74 ..	2	Lord Chesham, t.; C. S. Cantrell.
	Cambridgeshire ..	92 ..	1	J. Martin.
	Essex	190 ..	1	D. McIntosh.
	Hertfordshire ..	117 ..	2	J. B. Lawes, v.p.; J. Odams.
	Huntingdonshire ..	44 ..	2	Jabez Turner; W. Wells, t.
	Middlesex	295 ..	1	Sir Brandreth Gibbs, v.p.
	Norfolk	304 ..	3	Earl of Leicester; Hugh Aylmer; Robert Leeds.
	Oxfordshire	137 ..	2	Duke of Marlborough, t.; J. Druce.
	Suffolk	148 ..	2	Sir E. C. Kerrison, v.p.; R. C. Ransome.
		—1476	— 19	
B.	Cumberland	103 ..	1	S. P. Foster.
	Durham	108 ..	1	Earl of Ravensworth.
	Northumberland ..	144 ..	2	Sir M. White Ridley; Jacob Wilson.
	Westmoreland ..	65 ..	1	W. H. Wakefield.
		— 420	— 5	
C.	Derbyshire	132 ..	2	Lord Vernon, v.p.; H. Chandos-Pole-Gell.
	Leicestershire ..	98 ..	1	Duke of Rutland, t.
	Lincolnshire	213 ..	3	Sir W. Earle Welby-Gregory; W. Frankish; J. Shuttleworth.
	Northamptonshire	124 ..	1	Earl Spencer.
	Nottinghamshire ..	149 ..	1	J. Hemsley.
	Rutland	16 ..		
		— 732	— 8	

DISTRIBUTION OF MEMBERS OF THE SOCIETY—*continued.*

Districts.	Counties.	Number of Members.	Number in Council.	Members of Council.
D.	Berkshire	123	1	Colonel Loyd Lindsay.
	Cornwall	49		
	Devonshire	117	3	Sir T. D. Acland, T.; Sir M. Lopes; G. Turner.
	Dorsetshire	66	1	Viscount Portman, T.
	Hampshire	143	3	Viscount Eversley, V.P.; Sir A. K. Macdonald, T.; T. Pain.
	Kent	318	3	T. Aveling; R. Russell; C. Whitehead.
	Somersetshire	163	2	Visct. Bridport, T.; R. Neville.
	Surrey	133	1	C. E. Amos.
	Sussex	146	3	Earl of Chichester, V.P.; Duke of Richmond and Gordon, V.P.; W. Rigden.
	Wiltshire	104	1	J. Rawlence.
		—1362	— 18	
E.	Yorkshire	354	4	Earl Cathcart, V.P.; Earl of Feversham; J. D. Dent, T.; G. H. Sanday.
F.	Gloucestershire	211	3	E. Bowly; W. J. Edmonds; Col. Kingscote, T.
	Herefordshire	88	1	J. H. Arkwright.
	Monmouthshire	54	1	R. Stratton.
	Shropshire	391	3	John Evans; J. Bowen Jones; W. Sheraton.
	Staffordshire	307	2	Earl of Lichfield, T.; R. H. Masfen.
	Warwickshire	213	1	George Wise.
	Worcestershire	158	1	C. Randell.
	South Wales	156	1	Lt.-Col. Picton Turbervill.
		—1578	— 13	
G.	Cheshire	180	3	Hon. W. Egerton; D. R. Davies; John Torr.
	Lancashire	277	2	Duke of Devonshire, V.P.; Lord Skelmersdale, V.P.
	North Wales	198	2	Earl of Powis, T.; Sir W. W. Wynn, V.P.
		— 655	— 7	
	Scotland	84		
	Ireland	95		
	Channel Islands	9		
	Foreign Countries	87		
	Members without addresses	59		
		— 334		

ROYAL AGRICULTURAL

DR. HALF-YEARLY CASH ACCOUNT

	£ s. d.	£ s. d.	£ s. d.
To Balance in hand, 1st July, 1878:—			
Bankers	3467 5 8		
Secretary	28 4 5		
	3,495 10 1		
At Deposit, London and Westminster Bank	3,000 0 0		
			6,495 10 1
To Income:—			
Subscriptions:—	£. s. d.		
Governors' Life Compositions	100 0 0		
Governors' Annual	25 0 0		
Members' Life-Compositions	547 0 0		
Members' Annual	706 0 5		
	1,378 0 5		
Dividends on Stock	389 7 9		
Interest on Deposit Account	67 5 1		
Establishment:—			
Rent, &c.	101 10 0		
Journal:—			
Sales	168 7 6		
Advertisements	116 19 10		
	285 7 4		
Farm Inspection:—			
Prizes given by the Bristol Local Committee	195 0 0		
Entry Fees for 1879	41 0 0		
	236 0 0		
Liverpool Meeting	31 8 6		
Total Income			2,488 19 1
To Bristol Meeting			13,141 19 4
To London Exhibition			10 10 0
			£22,136 18 6

BALANCE-SHEET,

	£ s. d.	£ s. d.
LIABILITIES.		
To Capital:—		
Surplus, 30th June, 1878	31,743 8 10	
Less Excess of Expenditure over Income during the Half-year, viz.:—	£ s. d.	
Expenditure	4,277 16 1	
Income	2,488 19 1	
	1,788 17 0	
Less half-year's interest and depreciation on Country Meeting Plant	143 2 8	
	1,931 19 8	
		29,811 9 2
To Bristol Meeting:—		
Excess of Receipts over Expenditure		2,185 11 0
		£31,997 0 2

QUILTER, BALL, & CO., *Accountants.*

SOCIETY OF ENGLAND.

FROM 1ST JULY TO 31ST DECEMBER, 1878. CR.

	£ s. d.	£ s. d.	£ s. d.
By Expenditure:—			
Establishment:—			
Salaries, Wages, &c.	692 10 0		
House:—Rent, Taxes, Repairs, &c.	284 10 3		
Office:—Printing, Postage, Stationery, &c.	234 14 4		
		1,211 14 7	
Journal:—			
Printing and Stitching	907 6 0		
Postage and Delivery	250 0 0		
Literary Contributions	156 0 0		
Advertising	13 13 6		
		1,326 19 6	
Literary Contribution to Memoir prepared for International Congress at Paris		100 0 0	
Chemical:—			
Consulting Chemist's Salary	150 0 0		
On Account of New Laboratory	350 0 0		
		500 0 0	
Veterinary:—			
The Brown Institution, Half-year to Christmas		125 0 0	
Botanical:—			
Consulting Botanist's Salary		50 0 0	
Education:—			
Scholarships	140 0 0		
Advertising	3 9 6		
		143 9 6	
Farm Inspection:—			
Judges	218 15 0		
Prizes	215 0 0		
		433 15 0	
Subscription returned (paid in error)		1 0 0	
Sundries:—			
Secretary's Expenses at Paris Congress		25 0 0	
Liverpool Meeting		360 17 6	
Total Expenditure			4,277 16 1
By Bristol Meeting			14,408 19 1
By London Exhibition			3,249 9 9
By Balance in hand, 30th June:—			
Bankers		95 10 7	
Secretary		105 3 0	
			200 13 7
			£22,136 18 6

31ST DECEMBER, 1878.

ASSETS.	£ s. d.	£ s. d.
By Cash in hand	200 13 7	
By New 3 per Cent. Stock 26,511*l.* 11*s.* 5*d.**	25,340 7 1	
By Books and Furniture in Society's House	1,451 17 6	
By Country Meeting Plant	1,765 2 3	
		28,758 0 5
By London Exhibition		3,238 19 9
		£31,997 0 2

* *Value at* 95¼ = £25,252 5*s.* 5*d.*

Mem.—The above Assets are exclusive of the amount recoverable in respect of arrears of Subscription to 31st December, 1878, which at that date amounted to 839*l.*

Examined, audited, and found correct, this 24th day of February, 1879.

FRANCIS SHERBORN,
A. H. JOHNSON,
HENRY CANTRELL. } *Auditors on behalf of the Society.*

ROYAL AGRICULTURAL

DR. YEARLY CASH ACCOUNT,

	£. s. d.	£. s. d.	£. s. d.
To Balance in hand, 1st Jan. 1878:—			
Bankers	250 8 2		
Secretary	20 9 6		
		270 17 8	
At Deposit, London and Westminster Bank		1,000 0 0	
			1,270 17 8
To Income:—			
Subscriptions:—			
Governors' Life Compositions	100 0 0		
Governors' Annual	365 0 0		
Members' Life-Compositions	1,253 0 0		
Members' Annual	3,998 19 5		
		5,716 19 5	
Dividends on Stock		782 1 9	
Interest on Deposit Account		67 5 1	
Journal:—			
Sales	168 7 6		
Advertisements	116 19 10		
		285 7 4	
Farm-Inspection:—			
Bristol Local Committee (Prizes)	195 0 0		
Entry Fees for 1878	9 0 0		
Ditto 1879	41 0 0		
		245 0 0	
Establishment:—			
Rent, &c.		201 10 0	
Veterinary:—			
Donation from the Yorkshire Agricultural Society		100 0 0	
Total Income			7,398 3 7
To Country Meetings:—			
Liverpool	149 18 6		
Bristol	19,551 12 1		
		19,701 10 7	
London Exhibition		10 10 0	
			19,712 0 7
			£28,381 1 10

SOCIETY OF ENGLAND.

FROM 1ST JANUARY TO 31ST DECEMBER, 1878. CR.

By Expenditure:—	£. s. d.	£. s. d.	£. s. d.
Establishment:—			
Salaries, Wages, &c.	1,335 0 0		
House: Rent, Taxes, Repairs, &c.	629 3 8		
Office: Printing, Postage, &c.	580 7 4		
		2,544 11 0	
Journal:—			
Printing and Stitching	1,318 5 5*		
Postage and Delivery	405 0 0		
Literary Contributions	409 14 6		
Lithography	14 0 0		
Advertising	22 0 6		
Literary Contributions to Memoir presented to International Congress at Paris	292 17 0		
		2,169 0 5	
Chemical:—			
Consulting Chemist's Salary	300 0 0		
Grant for Investigations	200 0 0		
On account of new Laboratory	350 0 0		
		850 0 0	
Veterinary:—			
The Brown Institution for Investigations one year	250 0 0		
Prizes and Medals	47 12 0		
Fees to Examiners	21 0 0		
Professional Fees	14 18 6		
		333 10 6	
Botanical:—			
Consulting Botanist's Salary	. .	100 0 0	
Education:—			
Scholarships	140 0 0		
Prizes	25 0 0		
Fees to Examiners	52 10 0		
Advertising and Printing	17 18 6		
		235 8 6	
Subscriptions (paid in error) returned	. .	4 2 0	
Farm Inspection:—			
Prizes	215 0 0		
Judges	218 15 0		
Advertising	65 19 6		
		499 14 6	
Sundries:—			
Secretary's Expenses at Paris Congress	. .	25 0 0	
Total Expenditure	. .	. .	7,054 3 11
By Country Meetings:—			
Liverpool	. .	510 13 6	
Bristol	. .	17,366 1 1	
			17,876 14 7
By London Exhibition	. .	. .	3,249 9 9
By Balance in hand, 31st Dec.:—			
Bankers	. .	95 10 7	
Secretary	. .	105 3 0	
			200 13 7
			£28,381 1 10

* Including Printing of Memoir presented to the International Congress at Paris.

Receipts.

	£.	s.	d.
Subscription from Bristol	2,000	0	0
Admissions to Show-Yard by Payment	9,699	0	5
Admissions by Season Ticket	669	6	0
Admissions to Grand Stand	250	15	0
Sale of Catalogues	621	3	0
Entries in Implement Catalogue	400	0	0
Advertisements in Stock Catalogue	239	8	0
Implement Exhibitors' Payments for Shedding	3,006	5	3
Non-Members' Fees for entry of Implements	271	0	0
Fees for entry of Live Stock	607	10	0
Fees for Horse Boxes and Stalls	254	10	0
Fees for entry of Cheese and Butter	33	10	0
Premiums for Supply of Refreshments	505	0	0
Sale of Manure	4	2	6
Premium for Cloak Rooms and Lavatories	60	0	0
Fines for Non-Exhibition of Live Stock	75	0	0
Reference Number Fines	9	7	6
Sales of Butter, Curd, &c.	43	5	2
	£18,749	2	10

ACCOUNT, BRISTOL, 1878.

Expenditure.

	£. s. d.	£. s. d.
Show-Yard Works:—viz. Carriage, Storage, Erecting, Repairing, Painting, taking to pieces, Packing and Insurance of Permanent Buildings, and other Plant	801 3 6	
Implement Sheds, 1547*l.* 17*s.*; Seed and Model Sheds, 218*l.* 3*s.* 5*d.*	1766 0 5	
Stock Sheds, 817*l.* 10*s.* 1*d.*; Horse Boxes, 1060*l.* 19*s.* 10*d.*	1878 9 11	
Cheese and Butter Sheds, 125*l.* 12*s.* 11*d.*; Fodder Sheds, 41*l.* 12*s.* 10*d.*	167 5 9	
Horse and Cattle Rings, 32*l.* 2*s.* 10*d.*; Trial Shed, 105*l.* 5*s.* 8*d.*	137 8 6	
Fencing, Gates, &c., 245*l.* 11*s.* 4*d.*; Hurdles, 225*l.*	470 11 4	
Members' Club, 267*l.* 9*s.* 6*d.*; Lavatories, 53*l.* 3*s.* 8*d.*	320 13 2	
Grand Stand, 234*l.* 0*s.* 11*d.*; Band Stand, 105*l.* 5*s.* 8*d.*	339 6 7	
Platforms 75*l.* 17*s.* 4*d.*; other Offices and Works, 214*l.* 19*s.* 8*d.*	290 17 0	
Awnings, 56*l.* 13*s.* 10*d.*; Chairs, 32*l.* 16*s.* 6*d.*	89 10 4	
Draining Show-yard, 69*l.* 10*s.* 4*d.*; Clearing after show, 68*l.* 11*s.* 6*d.*	138 1 10	
Surveyor	314 3 6	
Depreciation of Plant	298 2 5	
		7,011 14 3
Judges: Implements, 132*l.*; Stock, 324*l.* 17*s.*; Cheese and Butter, 26*l.* 0*s.* 6*d.*		482 17 6
Consulting Engineers and Assistants		261 1 9
Veterinary Inspectors		86 2 0
Police: Metropolitan, 372*l.* 13*s.* 8*d.*; County, 12*l.* 13*s.* 4*d.*		385 7 0
Clerks and Assistants: Bankers, 31*l.* 10*s.*; Post Office, 30*l.* 18*s.* 2*d.*; Secretary and Stewards, 92*l.* 15*s.* 6*d.*		155 3 8
Journeys previous to Show, 16*l.* 7*s.* 6*d.*; Official Staff, 28*l.* 6*s.* 4*d.*		44 13 10
Assistant Stewards: Implements, 53*l.* 11*s.*; Stock, 38*l.* 10*s.*		92 1 0
Foremen: Implements, 22*l.* 0*s.* 8*d.*; Cattle, 12*l.* 6*s.* 4*d.*; Horses, 13*l.* 16*s.*; Sheep, 11*l.*; Pigs, 8*l.* 3*s.*; Fodder Yard, 18*l.* 15*s.*		86 1 0
Yardmen, Foddermen, Labourers, Grooms, &c.,		229 12 10
Index Clerk and Money Takers, 74*l.* 12*s.* 6*d.*; Money-changers, 10*l.* 10*s.*; Doorkeepers, &c., 37*l.* 9*s.*		122 11 6
Lodgings for Implement Judges, and other Officials		90 10 0
Stewards' Lodgings and Expenses		319 3 6
Refreshments for Stewards, Judges, and other Officials		202 17 1
Catalogues: Implements, 355*l.* 1*s.* 6*d.*; Stock, 187*l.* 15*s.*; Advertisements in ditto, 72*l.* 13*s.*; Awards, 28*l.* 11*s.* 6*d.*; Plan of Yard, 20*l.*; Sellers, 41*l.* 5*s.*; Carriage and Packing, 25*l.* 9*s.*		730 15 0
Printing, 590*l.* 4*s.* 11*d.*; Advertising and Bill Posting, 593*l.* 17*s.*		1184 1 11
Hay, 166*l.* 12*s.* 8*d.*; Straw, 351*l.* 7*s.* 7*d.*; Green Food, 287*l.* 17*s.* 6*d.*		805 17 9
Postage, Telegrams, Carriage, Stationery, Badges, &c.		130 10 2
Repairs, Insurance, and Carriage of Testing Machinery		70 4 3
Trials in Show-yard: Milk and Cream, 127*l.* 8*s.* 6*d.*; Ice, 7*l.* 10*s.*; Laying on Water, 22*l.* 11*s.*: Testing and Instruments, 8*l.* 16*s.* 7*d.*; Gas Engine, 19*l.* 7*s.* 4*d.*		185 13 5
Horse Hire, 81*l.* 11*s.* 3*d.*; Carriages, &c., 54*l.* 9*s.*		136 0 3
Caps and Jackets for men, 17*l.* 18*s.* 6*d.*; Veterinary Medicines, 2*l.* 5*s.* 4*d.*; Hire of Buckets, Brooms, Rakes, Weighing Machines, &c., 9*l.* 9*s.* 6*d.*		29 13 4
Royal Tent and Luncheon		253 9 6
Trials of Sheaf-binders, Labour, &c., 26*l.* 5*s.*; Surveyor, 11*l.* 15*s.*		38 0 0
Hire of Tent, 9*l.* 13*s.* 4*d.*; Hire of Furniture, 5*l.*; Tan and Ashes, 53*l.* 0*s.* 6*d.*; Oil, 3*l.*; Sundries, 15*l.* 6*s.* 1*d.*		85 19 11
Rosettes, 18*l.* 3*s.* 6*d.*; Medals, 24*l.* 7*s.*		42 10 6
Prizes: Stock, 3710*l.*; Implements, 110*l.*		3820 0 0
		£17,081 12 2
By Balance		1,667 10 8
		£18,749 2 10

Exclusive of 749*l.* offered by the Bristol Local Committee and 150*l.* by the Gloucestershire Agricultural Association.

London Exhibition, 1879.

ON MONDAY, THE 30TH JUNE, AND SIX FOLLOWING DAYS (SUNDAY EXCEPTED).

SCHEDULE OF PRIZES.

PRIZES FOR BRITISH LIVE-STOCK.

Reference Number in Certificates.	HORSES.	First Prize.	Second Prize.	Third Prize.
Class	STALLIONS.	£.	£.	£.
1	Agricultural Stallion, four years old and upwards, *not qualified to compete as Clydesdale or Suffolk*	50	20	10
2	Agricultural Stallion, three years old, *not qualified to compete as Clydesdale or Suffolk*	50	20	10
	***A Champion Cup, value £25, will be given for the best Stallion, three years old and upwards, in Classes 1 and 2.**			
3	Agricultural Stallion, two years old, *not qualified to compete as Clydesdale or Suffolk*	50	20	10
4	Agricultural Stallion, one year old, *not qualified to compete as Clydesdale or Suffolk*	20	10	5
	†A Champion Cup, value £25, will be given for the best two year-old or yearling Stallion in Classes 3 and 4.			
5	Clydesdale Stallion, four years old and upwards ..	50	20	10
6	Clydesdale Stallion, three years old	50	20	10
7	Clydesdale Stallion, two years old	50	20	10
8	Clydesdale Stallion, one year old	20	10	5
	‡Two Champion Cups, value £25 each, will be given for the best Stallion and the best Brood Mare or Filly in the Clydesdale Horse Classes.			
9	Suffolk Stallion, four years old and upwards ..	50	20	10
10	Suffolk Stallion, three years old	50	20	10
11	Suffolk Stallion, two years old	50	20	10
12	Suffolk Stallion, one year old	20	10	5
	§Two Champion "President's Cups," value £25 each, will be given for the best Stallion and the best Brood Mare or Filly in the Suffolk Horse Classes.			

* Offered by the Earl of Ellesmere, President of the English Cart Horse Society.
† Offered by the English Cart Horse Society.
‡ Offered by the Clydesdale Horse Society of Great Britain and Ireland.
§ Offered by Lord Waveney, President of the Suffolk Stud Book Association.

Reference Number in Certificates.	HORSES—*continued.*	First Prize.	Second Prize.	Third Prize.
Class		£	£	£
13	Thorough-bred Stallion, suitable for getting Hunters	100	25	10
14	Stallion, suitable for getting Coach Horses	50	20	10
15	Stallion, suitable for getting Hackneys, above 14 hands 2 inches and not exceeding 15 hands 2 inches	30	15	5
16	Pony Stallion, above 13 hands 2 inches and not exceeding 14 hands 2 inches	25	15	5
17	Pony Stallion, not exceeding 13 hands 2 inches	15	10	5
	BROOD MARES AND AGRICULTURAL FILLIES.			
18	Agricultural Mare and Foal, *not qualified to compete as Clydesdale or Suffolk*	30	20	10
19	Clydesdale Mare and Foal	30	20	10
20	Suffolk Mare and Foal	30	20	10
21	Agricultural Filly, three years old, *not qualified to compete as Clydesdale or Suffolk*	20	10	5
	***A Champion Cup, value £25, will be given for the best Mare or Filly (not Clydesdale or Suffolk), three years old and upwards, in Classes 18 or 21.**			
22	Clydesdale Filly, three years old	20	10	5
23	Suffolk Filly, three years old	20	10	5
24	Agricultural Filly, two years old, *not qualified to compete as Clydesdale or Suffolk*	20	10	5
25	Clydesdale Filly, two years old	20	10	5
26	Suffolk Filly, two years old	20	10	5
27	Yearling Agricultural Filly	15	10	5
28	Yearling Clydesdale Filly	15	10	5
29	Yearling Suffolk Filly	15	10	5
	***A Champion Cup, value £25, will be given for the best two-year-old or yearling Filly in Classes 24 and 27.**			
30	Hunter Mare and Foal	30	20	10
31	Coaching Mare and Foal	20	10	5
32	Hackney Mare and Foal, above 14 hands 2 inches and not exceeding 15 hands 2 inches	20	10	5
33	Pony Mare and Foal, above 13 hands 2 inches and not exceeding 14 hands 2 inches	15	10	5
	AGRICULTURAL MARES AND GELDINGS OF ANY BREED.			
34	Pair of Mares or Geldings (or one of each)	30	15	10
35	Gelding, four years old or upwards	20	10	5
36	Gelding, three years old	15	10	5
37	Gelding, two years old	15	10	5
38	Mare, four years old or upwards	20	10	5

* Offered by the English Cart Horse Society.

Reference Number in Certificates.	HORSES—*continued.*	First Prize.	Second Prize.	Third Prize.
Class		£	£	£
	HUNTERS.			
39	Hunter Mare or Gelding, up to 15 stone, five years old or upwards	50	20	10
40	Hunter Mare or Gelding, up to 12 stone, five years old or upwards	30	15	10
41	Hunter Gelding, four years old	25	15	10
42	Hunter Mare, four years old	25	15	10
43	Hunter Gelding, three years old	20	10	5
44	Hunter Mare, three years old	20	10	5
	COACH HORSES.			
45	Coaching Mare or Gelding, three years old	20	10	5
46	*Coaching Mare or Gelding, above three years old, suited to Omnibus work	25	..	..
	HACKNEYS AND ROADSTERS.			
47	Hackney Mare or Gelding, above 14.2 and not exceeding 15.2, and up to not less than 15 stone	20	10	5
48	Hackney Mare or Gelding, above 14.2 and not exceeding 15.2, and up to not less than 12 stone	20	10	5
49	Ladies' Hackney Mare or Gelding, not exceeding 15 hands	20	10	5
50	Hackney Mare or Gelding, above 13.2 and not exceeding 14.2	15	10	5
	PONIES.			
51	Pony Mare or Gelding, above 12.2 and not exceeding 13.2	15	10	5
52	Pony Mare or Gelding, not exceeding 12.2	15	10	5
	MULES.			
53	Any Variety, above 15 hands high, and suitable for agricultural and heavy draught purposes	20	10	5
54	Any Variety, not exceeding 15 hands, for general purposes	20	10	5
	ASSES OF ANY BREED.			
55	Stallion, three years old and upwards	20	10	5
56	She Ass with or without foal	20	10	5

* Offered by the London General Omnibus Company.

Reference Number in Certificates.	CATTLE.	First Prize.	Second Prize.	Third Prize.	Fourth Prize.
Class	(All Ages are calculated to 1st July, 1879, inclusive.)	£.	£.	£.	£.
	Shorthorn.				
57	Bull, above three years old	50	25	15	10
58	Bull, above two and not exceeding three years old	25	15	10	5
59	Yearling Bull, above one and not exceeding two years old	25	15	10	5
60	Bull-Calf, above six and not exceeding twelve months old	20	15	10	5
61	Cow, above three years old	20	15	10	5
62	Heifer, in-milk or in-calf, above two and not exceeding three years old	20	15	10	5
63	Yearling Heifer, above one and not exceeding two years old	20	15	10	5
64	Heifer-Calf, above six and not exceeding twelve months old	20	15	10	5
65	Cow, and not less than two of her offspring (Bull, Cow, or Heifer)	50	25	10	..
	***Two Champion Prizes of £100 each will be given for the best Shorthorn Male and the best Shorthorn Female in the Exhibition (see also Classes 248 to 251).**				
	Hereford.				
66	Bull, above three years old	30	20	10	..
67	Bull, above two and not exceeding three years old	25	15	5	..
68	Yearling Bull, above one and not exceeding two years old	25	15	5	..
69	Bull-Calf, above six and not exceeding twelve months old	15	10	5	..
70	Cow, above three years old	20	10	5	..
71	Heifer, in-milk or in-calf, above two and not exceeding three years old	15	10	5	..
72	Yearling Heifer, above one and not exceeding two years old	15	10	5	..
73	Heifer-Calf, above six and not exceeding twelve months old	15	10	5	..
74	Cow, and not less than two of her offspring (Bull, Cow, or Heifer)	30	15	10	..
	Two Champion Prizes of £50 each will be given for the best Hereford Male and the best Hereford Female in the Exhibition.				
	Devon.				
75	Bull, above three years old	30	20	10	..
76	Bull, above two and not exceeding three years old	25	15	5	..

* Offered by the Mansion House Committee. Exhibitors for the Mansion House Prizes will have the option of receiving medals in lieu of money prizes, such medals to be specially struck, and to be of three classes, namely, Gold, Silver, and Bronze.

Reference Number in Certificates.	CATTLE—*continued.*	First Prize.	Second Prize.	Third Prize.
Class		£.	£.	£.
77	Yearling Bull, above one and not exceeding two years old	25	15	5
78	Bull-Calf, above six and not exceeding twelve months old	15	10	5
79	Cow, above three years old	20	10	5
80	Heifer, in-milk or in-calf, above two and not exceeding three years old	15	10	5
81	Yearling Heifer, above one and not exceeding two years old	15	10	5
82	Heifer-Calf, above six and not exceeding twelve months old	15	10	5
	Two Champion Prizes of £50 each wil be given for the best Devon Male and the best Devon Female in the Exhibition.			
	SUSSEX.			
83	Bull, above three years old	20	10	5
84	Bull, above two and not exceeding three years old	20	10	5
85	Yearling Bull, above one and not exceeding two years old	15	10	5
86	Bull-Calf, above six and not exceeding twelve months old	10	5	..
87	Cow, above three years old	20	10	5
88	Heifer, in-milk or in-calf, above two and not exceeding three years old	15	10	5
89	Yearling Heifer, above one and not exceeding two years old	15	10	5
90	Heifer-Calf, above six and not exceeding twelve months old	10	5	5
	***Two Champion Cups, value £25 each, will be given for the best Sussex Male and the best Sussex Female in the Exhibition.**			
	LONG-HORN.			
91	Bull, above three years old	20	10	5
92	Bull, above two and not exceeding three years old	20	10	5
93	Yearling Bull, above one and not exceeding two years old	15	10	5
94	Cow, above three years old	20	10	5
95	Heifer, in-milk or in-calf, above two and not exceeding three years old	15	10	5
96	Yearling Heifer, above one and not exceeding two years old	15	10	5
	†**Two Champion Prizes of 25 guineas each will be given for the best Longhorn Male and the best Longhorn Female in the Exhibition.**			

* Offered by a Committee of Sussex Breeders. † Offered by the Longhorn Society.

Reference Number in Certificates.	CATTLE—*continued.*	First Prize.	Second Prize.	Third Prize.
Class		£.	£.	£.
	JERSEY.			
97	Bull, above two years old	20	10	5
98	Yearling Bull, above one and not exceeding two years old	20	10	5
99	Bull-Calf	10	5	..
100	Cow, above three years old	20	10	5
101	Heifer, in-milk or in-calf, above two and not exceeding three years old	20	10	5
102	Yearling Heifer, above one and not exceeding two years old	15	10	5
103	Heifer-Calf	10	5	..
	***Two Champion Prizes of £25 each will be given for the best Jersey Male and the best Jersey Female in the Exhibition.**			
	GUERNSEY.			
104	Bull, above one year old	20	10	5
105	Cow, above three years old	20	10	5
106	Heifer, in-milk or in-calf, above two and not exceeding three years old	20	10	5
	NORFOLK AND SUFFOLK POLLED.			
107	Bull, above two years old	20	10	5
108	Yearling Bull, above one and not exceeding two years old	15	10	5
109	Cow, above three years old	15	10	5
110	Heifer, in-milk or in-calf, above two and not exceeding three years old	15	10	5
111	Yearling Heifer, above one and not exceeding two years old	15	10	5
	†Two Champion Prizes of £25 each will be given for the best Norfolk and Suffolk Polled Bull, and for the best Norfolk and Suffolk Polled Cow or Heifer in the Exhibition.			
	WELSH.			
112	Bulls, above two years old	20	10	5
113	Yearling Bull, above one and not exceeding two years old	15	10	5
114	Cow, above three years old	15	10	5
115	Heifer, in-calf or in-milk, above two and not exceeding three years old	15	10	5
116	Yearling Heifer, above one and not exceeding two years old	15	10	5

* Offered by the Association for publishing the English Herd-book of Jersey Cattle.
† Offered by Breeders and Exhibitors of Norfolk and Suffolk Polled Cattle.

Reference Number in Certificates.	CATTLE—*continued.*	First Prize.	Second Prize.	Third Prize
Class		£	£	£
	AYRSHIRE.			
117	Bull, above two years old	20	10	5
118	Yearling Bull, above one and not exceeding two years old	15	10	5
119	Cow, above three years old	15	10	5
120	Heifer, in-calf or in-milk, above two and not exceeding three years old	15	10	5
	POLLED GALLOWAY.			
121	Bull, above two years old	20	10	5
122	Yearling Bull, above one and not exceeding two years old	15	10	5
123	Cow, above three years old	15	10	5
124	Heifer, in-calf or in-milk, above two and not exceeding three years old	15	10	5
	POLLED ANGUS, OR ABERDEEN.			
125	Bull, above two years old	20	10	5
126	Yearling Bull, above one and not exceeding two years old	15	10	5
127	Cow, above three years old	15	10	5
128	Heifer, in-calf or in-milk, above two and not exceeding three years old	15	10	5
	***A Champion Cup (or money), value £25, will be given for the best Polled Angus or Aberdeen animal in the Exhibition.**			
	WEST HIGHLAND.			
129	Bull, above two years old	20	10	5
130	Yearling Bull, above one and not exceeding two years old	15	10	5
131	Cow, above three years old	15	10	5
132	Heifer, in-calf or in-milk, above two and not exceeding three years old	15	10	5
	KERRY.			
133	Bull, of any age	20	10	5
134	Cow or Heifer, in-calf or in-milk	20	10	5
	OTHER BRITISH BREEDS.			
135	Bull, of any age	20	10	5
136	Cow or Heifer, in-calf or in-milk	20	10	5

* Offered by a Committee of Breeders of Polled Angus or Aberdeen Cattle.

Reference Number in Certificates.	CATTLE—*continued.*	First Prize.	Second Prize.	Third Prize.
Class		£.	£.	£.
	Dairy Cattle.			
137	Pair of Cows of any breed, in-milk, milking properties to be specially considered	25	15	10
138	Cow of any breed, in-milk, milking properties to be specially considered	25	15	10

SHEEP.

	Leicester.			
139	Shearling Ram	20	10	5
140	Ram of any other age	20	10	5
141	Pen of Five Shearling Ewes, of the same flock ..	15	10	5
142	Pen of Five Ewe Lambs, lambed in the year 1879 Wool Prizes (see p. xxxiv.).	15	10	5
	Border Leicester.			
143	Shearling Ram	20	10	5
144	Ram of any other age	20	10	5
145	Pen of Five Shearling Ewes, of the same flock ..	15	10	5
146	Pen of Five Ewe Lambs, lambed in the year 1879 Wool Prizes (see p. xxxiv.).	15	10	5
	Cotswold.			
147	Shearling Ram	20	10	5
148	Ram of any other age	20	10	5
149	Pen of Five Shearling Ewes, of the same flock ..	15	10	5
150	Pen of Five Ewe Lambs, lambed in the year 1879 Wool Prizes (see p. xxxiv.).	15	10	5
	Lincoln.			
151	Shearling Ram	20	10	5
152	Ram of any other age	20	10	5
153	Pen of Five Shearling Ewes, of the same flock ..	15	10	5
154	Pen of Five Ewe Lambs, lambed in the year 1879 Wool Prizes (see p. xxxiv.).	15	10	5
	Kentish or Romney Marsh.			
155	Shearling Ram	20	10	5
156	Ram of any other age	20	10	5
157	Pen of Five Shearling Ewes, of the same flock ..	15	10	5
158	Pen of Five Ewe Lambs, lambed in the year 1879 Wool Prizes (see p. xxxiv.).	15	10	5

Reference Number in Certificates.	SHEEP—*continued.*	First Prize.	Second Prize.	Third Prize.
Class		£.	£.	£.
	Oxfordshire Down.			
159	Shearling Ram	20	10	5
160	Ram of any other age	20	10	5
161	Pen of Five Shearling Ewes, of the same flock ..	15	10	5
162	Pen of Five Ewe Lambs, lambed in the year 1879 Wool Prizes (see p. xxxiv.).	15	10	5
	Southdown.			
163	Shearling Ram	20	10	5
164	Ram of any other age	20	10	5
165	Pen of Five Shearling Ewes, of the same flock ..	15	10	5
166	Pen of Five Ewe Lambs, lambed in the year 1879 Wool Prizes (see p. xxxiv.).	15	10	5
	Shropshire.			
167	Shearling Ram	20	10	5
168	Ram of any other age	20	10	5
169	Pen of Five Shearling Ewes, of the same flock ..	15	10	5
170	Pen of Five Ewe Lambs, lambed in the year 1879 Wool Prizes (see p. xxxiv.).	15	10	5
	Hampshire and other Short-Woolled Breeds. *Not qualified to compete for the Prizes offered for definite Short-woolled Breeds.*			
171	Shearling Ram	20	10	5
172	Ram of any other age	20	10	5
173	Pen of Five Shearling Ewes, of the same flock ..	15	10	5
174	Pen of Five Ewe Lambs, lambed in the year 1879 Wool Prizes (see p. xxxiv.).	15	10	5
	Cheviot.			
175	Shearling Ram	10	5	.
176	Ram of any other age	10	5	.
177	Pen of Five Shearling Ewes, of the same flock .. Wool Prizes (see p. xxxiv).	10	5	..
	Black-faced Mountain.			
178	Shearling Ram	10	5	..
179	Ram of any other age	10	5	..
180	Pen of Five Shearling Ewes, of the same flock .. Wool Prizes (see p. xxxiv.).	10	5	..

Reference Number in Certificates.	SHEEP—*continued.*	First Prize.	Second Prize.	Third Prize.
Class		£.	£.	£.
	HERDWICK.			
181	Shearling Ram	10	5	..
182	Ram of any other age	10	5	..
183	Pen of Five Shearling Ewes, of the same flock ..	10	5	..
	WOOL PRIZES (see p. xxxiv.).			
	LONK.			
184	Shearling Ram	10	5	..
185	Ram of any other age	10	5	..
186	Pen of Five Shearling Ewes, of the same flock ..	10	5	..
	WOOL PRIZES (see p. xxxiv.).			
	RYLAND.			
187	Shearling Ram	10	5	..
188	Ram of any other age	10	5	..
189	Pen of Five Shearling Ewes, of the same flock ..	10	5	..
	WOOL PRIZES (see p. xxxiv).			
	DEVON LONG-WOOL.			
190	Shearling Ram	10	5	..
191	Ram of any other age	10	5	..
192	Pen of Five Shearling Ewes, of the same flock ..	10	5	..
	WOOL PRIZES (see p. xxxiv).			
	SOMERSET AND DORSET HORNED.			
193	Shearling Ram	10	5	..
194	Ram, of any other age	10	5	..
195	Pen of Five Shearling Ewes, of the same flock ..	10	5	..
	WOOL PRIZES (see p. xxxiv.).			
	DARTMOOR.			
196	Shearling Ram	10	5	..
197	Ram, of any other age	10	5	..
198	Pen of Five Shearling Ewes, of the same flock ..	10	5	..
	WOOL PRIZES (see p. xxxiv.).			
	EXMOOR.			
199	Shearling Ram	10	5	..
200	Ram, of any other age	10	5	..
201	Pen of Five Shearling Ewes, of the same flock ..	10	5	..
	WOOL PRIZES (see p. xxxiv.).			

Reference Number in Certificates.	SHEEP—*continued.*	First Prize.	Second Prize.	Third Prize.
Class		£.	£.	£.
	WELSH MOUNTAIN.			
202	Shearling Ram	10	5	..
203	Ram, of any other age	10	5	..
204	Pen of Five Shearling Ewes, of the same flock ..	10	5	..
	WOOL PRIZES (see p. xxxiv.).			
	LIMESTONE.			
205	Shearling Ram	10	5	..
206	Ram of any other age	10	5	..
207	Pen of Five Shearling Ewes, of the same flock ..	10	5	..
	WOOL PRIZES (see p. xxxiv.).			
	ROSCOMMON.			
208	Shearling Ram	10	5	..
209	Ram of any other age	10	5	..
210	Pen of Five Shearling Ewes, of the same flock ..	10	5	..
	WOOL PRIZES (see p. xxxiv.).			
	OTHER BRITISH LONG-WOOLLED BREEDS.			
	Not qualified to compete in any of the preceding classes of Long-woolled Sheep.			
211	Shearling Ram	10	5	..
212	Ram of any other age	10	5	..
213	Pen of Five Shearling Ewes, of the same flock ..	10	5	..
	WOOL PRIZES (see p. xxxiv.).			
	GOATS.			
	SHORT-HAIRED BRITISH.			
214	Male	5	3	..
215	Female, in-milk or in-kid	5	3	..
	LONG-HAIRED BRITISH.			
216	Male	5	3	..
217	Female, in-milk or in-kid	5	3	..

Reference Number in Certificates.	PIGS.	First Prize.	Second Prize.	Third Prize.
Class		£.	£.	£.
	LARGE WHITE BREED.			
218	Boar, above six months and not exceeding twelve months old	10	5	..
219	Boar, above twelve months old	10	5	..
220	Pen of Three Breeding Sow-Pigs of the same litter, above three and not exceeding six months old	10	5	..
221	Breeding Sow	10	5	..
	SMALL WHITE BREED.			
222	Boar, above six months and not exceeding twelve months old	10	5	..
223	Boar, above twelve months old	10	5	..
224	Pen of Three Breeding Sow-Pigs of the same litter, above three and not exceeding six months old	10	5	..
225	Breeding Sow	10	5	..
	SMALL BLACK BREED.			
226	Boar, above six months and not exceeding twelve months old	10	5	..
227	Boar, above twelve months old	10	5	..
228	Pen of Three Breeding Sow-Pigs of the same litter, above three and not exceeding six months old	10	5	..
229	Breeding Sow	10	5	..
	BERKSHIRE BREED.			
230	Boar, above six months and not exceeding twelve months old	10	5	..
231	Boar, above twelve months old	10	5	..
232	Pen of Three Breeding Sow-Pigs of the same litter, above three and not exeeeding six months old	10	5	..
233	Breeding Sow	10	5	..
	OTHER BREEDS. *Not eligible to compete in any of the preceding Classes.*			
234	Boar, above six months and not exceeding twelve months old	10	5	..
235	Boar, above twelve months old	10	5	..
236	Pen of three Breeding Sow-Pigs of the same litter, above three and not exceeding six months old ..	10	5	..
237	Breeding Sow	10	5	..

Prizes for Foreign Live Stock.

Reference Number in Certificates. Class		First Prize. £.	Second Prize. £.	Third Prize. £.
	FOREIGN HORSES.			
	Percheron and Boulonnais.			
238	*Stallion, three years old and upwards	50	20	10
239	*Mare with or without Foal	30	20	10
	Norman and Anglo-Norman.			
240	*Stallion, three years old and upwards	50	20	10
241	*Mare with or without Foal	30	20	10
	Flemish.			
242	*Stallion, three years old and upwards	50	20	10
243	*Mare with or without Foal	30	20	10
	Other Foreign Draught Horses.			
244	*Stallion, three years old and upwards	50	20	10
245	*Mare with or without Foal	30	20	10
	Foreign Riding and Carriage Horses.			
246	*Stallion, three years old and upwards	50	20	10
247	*Mare with or without Foal	30	20	10
	FOREIGN CATTLE.			
	Shorthorns.			
	Bred in any non-prohibited European Country other than the United Kingdom.			
248	‡Bull, above two years old	25	15	10
249	‡Bull, not exceeding two years old	25	15	10
250	‡Cow, above three years old	25	15	10
251	‡Heifer, not exceeding three years old	25	15	10
	***Two Champion Prizes of £100 each will be given for the best Shorthorn Male and the best Shorthorn Female in the Exhibition (whether Foreign or English).**			

* Offered by the Mansion House Committee.

† Prizes offered for Foreign Cattle, Sheep, and Pigs do not apply to animals from any country from which importation of such animals is prohibited by any Order of the Privy Council, and entries will be received subject to such Quarantine and other Regulations as the Privy Council may impose. ‡ Offered by the Shorthorn Society.

Reference Number in Certificates.	FOREIGN CATTLE—*continued.*	First Prize.	Second Prize.	Third Prize.
Class		£.	£.	£.
	CHAROLAIS.			
252	*Bull, above two years old	25	15	5
253	*Bull, not exceeding two years old	15	10	5
254	*Cow, above three years old	20	10	5
255	*Heifer, not exceeding three years old	15	10	5
	GARONNAIS.			
256	*Bull, above two years old	25	15	5
257	*Bull, not exceeding two years old	15	10	5
258	*Cow, above three years old	20	10	5
259	*Heifer, not exceeding three years old	15	10	5
	LIMOUSIN.			
260	*Bull, above two years old	25	15	5
261	*Bull, not exceeding two years old	15	10	5
262	*Cow, above three years old	20	10	5
263	*Heifer, not exceeding three years old	15	10	5
	NORMAN.			
264	*Bull, above two years old	25	15	5
265	*Bull, not exceeding two years old	15	10	5
266	*Cow, above three years old	20	10	5
267	*Heifer, not exceeding three years old	15	10	5
	BRETON.			
268	*Bull, above two years old	25	15	5
269	*Bull, not exceeding two years old	15	10	5
270	*Cow, above three years old	20	10	5
271	*Heifer, not exceeding three years old	15	10	5
	DUTCH AND FLEMISH.			
272	*Bull, above two years old	25	15	5
273	*Bull, not exceeding two years old	15	10	5
274	*Cow, above three years old	20	10	5
275	*Heifer, not exceeding three years old	15	10	5
	SWISS.			
276	*Bull, above two years old	25	15	5
277	*Bull, not exceeding two years old	15	10	5
278	*Cow, above three years old	20	10	5
279	*Heifer, not exceeding three years old	15	10	5

* Offered by the Mansion House Committee.

Reference Number in Certificates.	FOREIGN CATTLE—*continued.*	First Prize.	Second Prize.	Third Prize.
Class		£.	£.	£.
	SPANISH AND PORTUGUESE.			
280	*Bull, above two years old	25	15	5
281	*Bull, not exceeding two years old	15	10	5
282	*Cow, above three years old	20	10	5
283	*Heifer, not exceeding three years old	15	10	5
	ANGELN.			
284	*Bull, above two years old	25	15	5
285	*Bull, not exceeding two years old	15	10	5
286	*Cow, above three years old	20	10	5
287	*Heifer, not exceeding three years old	15	10	5
	JUTLAND.			
288	*Bull, above two years old	25	15	5
289	*Bull, not exceeding two years old	15	10	5
290	*Cow, above three years old	20	10	5
291	*Heifer, not exceeding three years old	15	10	5
	SCHLESWIG-HOLSTEIN MARSH BREEDS.			
292	*Bull, above two years old	25	15	5
293	*Bull, not exceeding two years old	15	10	5
294	*Cow, above three years old	20	10	5
295	*Heifer, not exceeding three years old	15	10	5
	OTHER FOREIGN BREEDS (for meat producing purposes) from any non-prohibited Country.			
296	*Bull, above two years old	25	15	5
297	*Bull, not exceeding two years old	15	10	5
298	*Cow, above three years old	20	10	5
299	*Heifer, not exceeding three years old	15	10	5
	OTHER FOREIGN BREEDS (for milking purposes) from any non-prohibited Country.			
300	*Bull, above two years old	25	15	5
301	*Bull, not exceeding two years old	15	10	5
302	*Cow, above three years old	20	10	5
303	*Heifer, not exceeding three years old	15	10	5

* Offered by the Mansion House Committee.

Reference Number in Certificates, Class	FOREIGN SHEEP.	First Prize. £	Second Prize. £.	Third Prize. £.
	French Merino.			
304	*Ram	15	10	..
305	*Pen of Five Ewes or Gimmers	15	10	..
	Wool Prizes (see p. xxxiv).			
	German Merino.			
306	*Ram	15	10	..
307	*Pen of Five Ewes or Gimmers	15	10	..
	Wool Prizes (see p. xxxiv).			
	Spanish Merino.			
308	*Ram	15	10	..
309	*Pen of Five Ewes or Gimmers	15	10	..
	Wool Prizes (see p. xxxiv).			
	Pure Long-Woolled Sheep (not Merinos) *Of any English or Foreign race, bred in any Country except the United Kingdom.*			
310	*Ram	15	10	..
311	*Pen of Five Ewes or Gimmers	15	10	..
	Wool Prizes (see p. xxxiv).			
	Pure Short-Woolled Sheep (not Merinos) *Of any English or Foreign race, bred in any Country except the United Kingdom.*			
312	*Ram	15	10	..
313	*Pen of Five Ewes or Gimmers	15	10	..
	Wool Prizes (see p. xxxiv).			
	Foreign Goats (of any variety).			
314	†Male	8	4	2
315	†Female, in milk or in-kid	8	4	2

* Offered by the Mansion House Committee.
† Offered by a Committee of Subscribers.

Prizes for British and Foreign Produce.

Reference Number in Certificates.		First Prize.	Second Prize.	Third Prize.
Class	**HOPS.**	£.	£.	£.
316	*Pocket of East-Kent Hops	20	10	5
317	*Pocket of Mid-Kent Hops	20	10	5
318	*Pocket of Weald of Kent Hops	20	10	5
319	*Pocket of Sussex Hops	20	10	5
320	*Pocket of Farnham Hops	20	10	5
321	*Pocket of Worcester and Hereford Hops	20	10	5
322	*Pocket of Hops, grown in any other District of England	20	10	5
323	†Bale of Foreign Hops	20	10	5
	SEED CORN.			
324	One Sack of a new variety of Wheat, with sample bundle of straw, to be delivered before the 1st of October, 1879	25	10	..
325	One Sack of a newer and improved variety of Wheat, with sample bundle of straw, to be delivered before the 1st of October, 1882	25	10	..
	WOOL.			
326	Three Fleeces of each English Breed for which Prizes are offered or animals exhibited	3	2	..
327	†Three Fleeces of each Foreign Breed for which Prizes are offered or animals exhibited	3	2	..
	BUTTER.			
328	Firkin, Crock, or Package of Irish keeping Butter, 14 lbs. or upwards	5	3	..
329	Firkin, Crock, or Package of Welsh keeping Butter, 14 lbs. or upwards	5	3	..
330	Firkin, Crock, or Package of English or Scotch keeping Butter, 14 lbs. or upwards	5	3	..
331	†Firkin, Crock, or Package of Canadian, or American keeping Butter, 14 lbs. or upwards	5	3	..

* Offered by a Committee of Hop-growers and Hop-factors.
† Offered by the Mansion House Committee.

Reference Number in Certificates.	BUTTER—*continued.*	First Prize.	Second Prize.	Third Prize.	Fourth Prize.
Class		£	£	£	£
332	*Firkin, Crock, or Package of French keeping Butter, 14 lbs. or upwards	5	3	..	.
333	*Firkin, Crock, or Package of Scandinavian (Danish Swedish, or Norwegian) keeping Butter, 14 lbs. or upwards	5	3	..	.
334	*Firkin, Crock, or Package of Dutch keeping Butter, 14 lbs. or upwards	5	3	..	..
335	*Firkin, Crock, or Package of other European keeping Butter, 14 lbs. or upwards	5	3	..	..
	***A Champion Prize for the best lot of keeping Butter in either of the above classes, £10 and the large Silver Medal.**				
336	Six Pounds of Fresh Butter (any make, English or Foreign)	10	6	4	2
	The Exhibitor must be the manufacturer and *bona-fide* owner of the Butter entered to compete for the Prizes offered.				
	CHEESE.				
	CHESHIRE.				
337	Three Cheeses above 50 lbs. weight each, coloured or plain	15	10	5	.
388	Three Cheeses under 50 lbs. weight each, coloured or plain	15	10	5	..
	CHEDDAR.				
339	Three Cheeses above 50 lbs. weight each, coloured or plain	15	10	5	..
340	Three Cheeses under 50 lbs. weight each, coloured or plain	15	10	5	..
	STILTON.				
341	Three Cheeses under 20 lbs. weight each, coloured or plain	15	10	5	..
	BRITISH CREAM CHEESES.				
342	Six Cheeses of the same make	10	5	..	..

* Offered by the Mansion House Committee.

Reference Number in Certificates.	CHEESE—*continued.*	First Prize	Second Prize.	Third Prize.
Class		£.	£.	£.
	ANY OTHER BRITISH MAKE.			
343	Three Cheeses above 25 lbs. weight each, coloured or plain	15	10	5
344	Three Cheeses, not exceeding 25 lbs. weight each, coloured or plain	15	10	5
	CANADIAN OR AMERICAN.			
345	*Three Cheeses above 40 lbs. weight each, coloured or plain	15	10	5
	EDAM.			
346	*Three Cheeses of the same make, coloured or pale	10	5	..
	GRUYÈRE.			
347	*Three Cheeses of the same make	10	5	..
	PARMESAN.			
348	*Three Cheeses of the same make	10	5	..
	GORGONZOLA.			
349	*Three Cheeses of the same make	10	5	..
	CAMEMBERT.			
350	*A package of six Cheeses of the same make ..	10	5	..
	ROQUEFORT.			
351	*Three Cheeses of the same make	10	5	..
	FRENCH CREAM CHEESES.			
352	*A package of one dozen or more Cheeses of the same make	10	5	..
	The Exhibitor must be the Manufacturer and *bona-fide* owner of the Cheese entered to compete for the Prizes offered. No Cheese exhibited to have been ironed or bored, or otherwise tested, or it will be disqualified.			

* Offered by the Mansion House Committee.

Reference Number in Certificates. Class	HAMS AND BACON. *Open to Curers only, and place of curing, brand, &c., to be stated.*	First Prize. £	Second Prize. £.	Third Prize. £.
353	Six British Hams (long cut) from 10 to 28 lbs. each	15	10	5
354	*Six Canadian or American Hams (long cut) from 10 to 28 lbs. each	15	10	5
355	*Six Foreign Hams (long cut) from 10 to 28 lbs. each	15	10	5
356	Three sides of British Bacon from 50 lbs. each ..	15	10	5
357	*Three sides of Canadian or American Bacon from 40 lbs. each	15	10	5
358	*Three sides of Foreign Bacon from 40 lbs. each ..	15	10	5
	PRESERVED MEATS.			
359	*Best specimen of Preserved Beef	10	..	..
360	*Best specimen of Preserved Mutton	10	..	..
361	*Best specimen of Preserved Pork	10	..	..
362	*Best specimen of Preserved Poultry	5	..	..
363	*Best specimen of Preserved Game	5	..	..
364	*Best specimen of other Preserved Provisions ..	5	..	..
	The specimens entered to compete in Classes 359 to 364 must have been killed not less than six months before the opening day of the Exhibition, and must be delivered not less than one month previous to the date of the Exhibition.			
	AMERICAN OR EUROPEAN FRESH MEAT.			
365	*Two Hind and two Fore quarters of Beef of one consignment, which shall arrive in the best condition after having travelled a distance of not less than 1000 miles	25	..	..
366	*Four Carcasses of Mutton of one consignment, which shall arrive in the best condition after having travelled a distance of not less than 1000 miles	25	..	..
367	*Two Hind and two Fore quarters of Beef of one consignment, which shall have been slaughtered not less than 14 days prior to the Exhibition being opened	25	..	..
368	*Four Carcasses of Mutton of one consignment, which shall have been slaughtered not less than 14 days prior to the Exhibition being opened ..	25	..	..
	PERRY.			
369	†Three dozen quart bottles. Open to all England	10	5	..
	All Perry to be *made* by the Exhibitor, of his own produce.			

* Offered by the Mansion House Committee. † Offered by M. Biddulph, Esq., M.P.

Reference Number in Certificates.		First Prize.	Second Prize.
	CIDER.	£.	£.
Class 370	*Cask of not less than 54 gallons made in the Autumn of 1878 (Herefordshire and West Midland Counties)	10	5
371	*Cask of not less than 54 gallons made in the Autumn of 1878 (Devonshire and Western Counties)	10	5
	***Champion Prize of £5 for the best cask. Open to all England.**		
372	*Three dozen quart bottles (Herefordshire and West Midland)	10	5
373	*Three dozen quart bottles (Devonshire and Western Counties)	10	5
	***Champion Prize of £5 for the best three dozen bottles. Open to all England.**		
	All Cider to be *made* by the Exhibitor, of his own produce.		
	BEES AND HIVES.		
	(British or Foreign.)		
374	†For the best Observatory Hive, stocked with Bees and their Queen, all combs to be visible on both sides	3	2
375	†For the best Hive, on the movable comb principle, with covering and stand	3	2
376	†For the best Exhibition of Pure Honey in sectional supers—each section to be separable, and not more than 3 lbs. in weight, the total weight of each entry not to be less than 12 lbs. The Honey to be submitted to analysis, if required by the Judges or Stewards	3	2
377	†For the Competitor who shall in the neatest, quickest, and most complete manner drive out the Bees from a straw skep, capture and exhibit the Queen, and transfer both combs and Bees into a Hive on the movable comb principle. Competitors to provide their own Bees and Hives. No veils or gloves to be worn	3	2
	In each of the Classes 374, 375, and 376, a Hive of British Manufacture, with cover and stand complete, on the movable comb principle, will be presented to the Foreign Competitor to whom the Judges shall award the highest honours.		

* Offered by M. Biddulph, Esq., M.P.
† Offered by the British Bee-keepers' Association.

SPECIAL PRIZES.

A GOLD MEDAL and £50, offered by the Mansion House Committee.

For the best Waggon for conveying perishable goods, meat, poultry, fish, &c. by railway, at a low temperature, a journey of 500 miles, the trucks to retain their contents at a temperature not exceeding 45° Fahr., for six days.

PLANS OF FARM BUILDINGS.

	Prizes.
For Arable Farms above 300 acres	£50
For Arable Farms not exceeding 300 acres ..	50
For Dairy Farms above 100 acres	50
For Dairy Farms not exceeding 100 acres	50

The plans, on a scale of 8 feet to the inch, with complete specifications and money bills of quantities must be sent in, addressed to the Secretary, so as to reach 12, Hanover Square, on or before June 26th, 1879.

SILVER MEDALS.

There are Ten Silver Medals, the award of which the Judges appointed by the Council have the power of recommending in cases of sufficient merit in New Implements exhibited at the London Exhibition.

2. These Medals cannot *in any case* be awarded to any implement, unless the principle of the implement, or of the improvement of it, be entirely new. No Medal shall be awarded by the Judges without the consent of the Stewards, and no Commendation of Miscellaneous Articles shall be made by the Judges.

3. The Judges are also empowered to make special awards of Medals for efficient modes of guarding or shielding Machinery, especially when worked by steam, from contact with persons immediately engaged in attending to such machinery while at work.

4. No Medal shall, in any case, be awarded to any Implement or Miscellaneous Article capable of Trial until it has been subjected to such Trial as the Stewards may direct.

CONDITIONS APPLYING TO CERTAIN BRITISH CLASSES ONLY.

Horses.

1. All foals must be the offspring of the mare along with which they are exhibited; and the sire of the foal must be given on the certificate of entry.

2. No veterinary inspection of horses will be required except when considered necessary by the Judges, who will be accompanied by the Veterinary Inspectors.

3. Hunters and Hackneys entered to compete in the light-weight classes will be disqualified if, in the opinion of the Judges, they are eligible to compete in the heavy-weight classes.

4. Horses entered as Clydesdales must be certified to have a recognised Clydesdale sire and sire of dam.

5. Any exhibitor wishing to remove his horse for the night will be allowed to do so on depositing 10*l.* at the Secretary's office, and receiving an official pass—the time of leaving, and that of returning next morning, to be inserted thereon; and if the animal be not duly brought back, the sum of 10*l.* will be forfeited to the Society for each Show day the animal is absent; and the exhibitor will also forfeit any prize awarded to him in any class at the Exhibition, and will not be allowed to exhibit again at the Society's Show until the forfeits are paid.

Cattle.

6. No bull above two years old will be eligible for a Prize unless certified to have served not less than three different cows (or heifers) within the three months preceding the 1st of May in the year of the Exhibition.

7. All bulls above one year old shall have rings or "bull-dogs" in their noses, and *must be provided with leading sticks.*

8. No cow will be eligible for a Prize unless certified either at the date of entry or between the date of entry and that of the Exhibition to have had a living calf,—or that the calf, if dead, was born at its proper time,—within the twelve months preceding the date of the Exhibition.

9. No heifer, entered as in-calf, will be eligible for a Prize unless she is certified to have been bulled before the 31st of March in the year of the Show, nor will her owner afterwards receive the Prize until he shall have furnished the Secretary with a further certificate before the 31st of January in the subsequent year, that she produced a living calf; or that the calf, if dead, was born at its proper time.

10. Cows and heifers entered as in-milk in the classes for Dairy Breeds and Dairy Cattle must be milked dry on the evening of June 29, in the presence of an officer of the Society specially appointed for the purpose.

11. *Shorthorns.*—Each animal entered in the Shorthorn Classes must be certified by the Exhibitor to be entered, or eligible to be entered, in Coates's 'Herd-Book.'

Sheep.

12. All rams, except shearlings, must have been used in the preceding year.

13. Sheep exhibited for any of the prizes must have been *really and fairly*

shorn bare after the 1st of April in the year of the Exhibition; and the date of such shearing must form part of the Certificate of Entry.

14. Lambs must not have been shorn or trimmed previous to the Exhibition, nor must they be shorn or trimmed during the Exhibition.

Goats.

15. British Goats without horns will be disqualified for competition.

Pigs.

16. The three sow-pigs in each pen must be of the same litter.

17. The breeding sows in Classes 221, 225, 229, 233, and 237, shall be certified to have had a litter of live pigs within the six months preceding the Exhibition, or to be in-pig at the time of entry, so as to produce a litter before the 1st of September following. In the case of in-pig sows, the Prize will be withheld until the exhibitor shall have furnished the Secretary with a certificate of farrowing, as above.

18. No sow, if above eighteen months old, that has not produced a litter of live pigs, shall be eligible to compete in any of the classes.

19. The Judges of pigs will be instructed, with the sanction of the Stewards, to withhold prizes from any animals which shall appear to them to have been entered in a wrong class.

20. All pigs exhibited at the Country Meetings of the Society shall be subjected to an examination of their mouths by the Veterinary Inspector of the Society; and should the state of dentition in any pig indicate that the age of the animal has not been correctly returned in the Certificate of Entry, the Stewards shall have power to disqualify such pig, and shall report the circumstance to the Council at its ensuing Monthly Meeting. Every pig which shall be found on examination by the Inspector to be oiled or coloured will be disqualified for competition and removed from the Exhibition; as well as any pig which shall be oiled or coloured while in the Exhibition.

21. If a litter of pigs be sent with a breeding sow, the young pigs must be the produce of the sow, and must not exceed two months old.

RULES OF ADJUDICATION FOR BRITISH BREEDS.

1. As the object of the Society in giving prizes for cattle, sheep, and pigs, is to promote improvement in *breeding* stock, the Judges, in making their awards, will be instructed not to take into their consideration the present value to the butcher of animals exhibited, but to decide according to their relative merits for the purpose of *breeding*.

2. If, in the opinion of the Judges, there should be equality of merit, they will be instructed to make a special report to the Council, who will decide on the award.

3. The Judges will be instructed to withhold any prize if they are of opinion that there is not sufficient merit in any of the stock exhibited for such Prize to justify an award.

4. No Third Prize will be given unless at least Six animals be exhibited, and no Second Prize will be given unless at least Three animals be exhibited, and no Fourth Prize will be given in either of the Shorthorn Classes, Nos. 57

to 64, unless at least Ten animals be exhibited, except on the special recommendation of the Judges to the Stewards of Live Stock.

5. The Judges will be instructed to give in a *Reserved Number* in each class of live stock: viz., which animal would, in their opinion, possess sufficient merit for the Prize, in case the animal to which the Prize is awarded should subsequently become disqualified.

6. In the classes for stallions, mares, and fillies, the Judges in awarding the Prizes will be instructed, in addition to symmetry, to take activity and strength into their consideration.

7. The attention of the Stewards and Judges is particularly called to the conditions applying to pigs. The Senior Steward of Live Stock is requested to report any malpractices on the part of Exhibitors, and any person found guilty will not be allowed to exhibit at future Meetings of the Society.

The Judges will be instructed to deliver to the Stewards their awards, signed, and stating the numbers to which the Prizes are adjudged, before they leave the Exhibition, noting any disqualifications. They are to transmit, under cover to the Secretary immediately after the Exhibition, their Reports on the several classes in which they have adjudicated, in order that each Report may be included in the General Report of the Exhibition of Live Stock at Kilburn to be published in the 'Journal' of the Society.

DATES OF ENTRY FOR LIVE STOCK AND IMPLEMENTS.

CERTIFICATES for the entry of Implements for the London Exhibition must be forwarded to the Secretary of the Society, No. 12, Hanover Square, London, W., by the 1st of April, and Certificates for the entry of Live Stock, Cheese, Butter, &c., by the 1st of May. Certificates received after those respective dates will not be accepted, but returned to the persons by whom they have been sent.

The Prizes of the Royal Agricultural Society of England, and all Prizes offered by the Mansion House Committee, are open to general competition.

*** Forms of Certificate for entry, as well as Prize-Sheets for the London Exhibition, containing the whole of the conditions and regulations, may be obtained at the Office of the Society, No. 12, Hanover Square, London, W.

MEMORANDA.

ADDRESS OF LETTERS.—The Society's office being situated in the postal district designated by the letter W, Members, in their correspondence with the Secretary, are requested to subjoin that letter to the usual address.

GENERAL MEETING in London, May 22, 1879, at 12 o'clock.

MEETING in London, at Kilburn, July, 1879.

GENERAL MEETING in London, December, 1879.

MONTHLY COUNCIL (for transaction of business), at 12 o'clock on the first Wednesday in every month, excepting January, September, and October: open only to Members of Council and Governors of the Society.

ADJOURNMENTS.—The Council adjourn over Passion and Easter weeks, when those weeks do not include the first Wednesday of the month; from the first Wednesday in August to the first Wednesday in November; and from the first Wednesday in December to the first Wednesday in February.

OFFICE HOURS.—10 to 4. On Saturdays, 10 to 2.

DISEASES of Cattle, Sheep, and Pigs.—Members have the privilege of applying to the Veterinary Committee of the Society, and of sending animals to the Royal Veterinary College, Camden Town, N.W.—(A statement of these privileges will be found on page xliv.)

CHEMICAL ANALYSIS.—The privileges of Chemical Analysis enjoyed by Members of the Society will be found stated in this Appendix (page xlv.).

BOTANICAL PRIVILEGES.—The Botanical and Entomological Privileges enjoyed by Members of the Society will be found stated in this Appendix (page xlviii).

SUBSCRIPTIONS.—1. Annual.—The subscription of a Governor is £5, and that of a Member £1, due in advance on the 1st of January of each year, and becoming in arrear if unpaid by the 1st of June. 2. For Life.—Governors may compound for their subscription for future years by paying at once the sum of £50, and Members by paying £10. Governors and Members who have paid their annual subscription for 20 years or upwards, and whose subscriptions are not in arrear, may compound for future annual subscriptions, that of the current year inclusive, by a single payment of £25 for a Governor, and £5 for a Member.

PAYMENTS.—Subscriptions may be paid to the Secretary, in the most direct and satisfactory manner, either at the Office of the Society, No. 12, Hanover Square, London, W., or by means of post-office orders, to be obtained at any of the principal post-offices throughout the kingdom, and made payable to him at the Vere Street Office, London, W.; but any cheque on a banker's or any other house of business in London will be equally available, if made payable on demand. In obtaining post-office orders care should be taken to give the postmaster the correct initials and surname of the Secretary of the Society (H. M. Jenkins), otherwise the payment will be refused to him at the post-office on which such order has been obtained; and when remitting the money-orders it should be stated by whom, and on whose account, they are sent. Cheques should be made payable as drafts on demand (not as bills only payable after sight or a certain number of days after date), and should be drawn on a London (not on a local country) banker. When payment is made to the London and Westminster Bank, St. James's Square Branch, as the bankers of the Society, it will be desirable that the Secretary should be advised by letter of such payment, in order that the entry in the banker's book may be at once identified, and the amount posted to the credit of the proper party. No coin can be remitted by post, unless the letter be registered.

NEW MEMBERS.—Every candidate for admission into the Society must be proposed by a Member; the proposer to specify in writing the full name, usual place of residence, and post-town, of the candidate, either at a Council meeting, or by letter addressed to the Secretary. Forms of Proposal may be obtained on application to the Secretary.

*** Members may obtain on application to the Secretary copies of an Abstract of the Charter and Bye-laws, of a Statement of the General Objects, &c., of the Society, of Chemical, Botanical, and Veterinary Privileges, and of other printed papers connected with special departments of the Society's business.

Members' Veterinary Privileges.

I.—Serious or Extensive Diseases.

1. Any Member of the Society who may desire professional attendance and special advice in cases of serious or extensive disease among his cattle, sheep, or pigs, and will address a letter to the Secretary, will, by return of post, receive a reply stating whether it be considered necessary that the Society's Veterinary Inspector should visit the place where the disease prevails.

2. The remuneration of the Inspector will be 2*l.* 2*s.* each day as a professional fee, and 1*l.* 1*s.* each day for personal expenses; and he will also be allowed to charge the cost of travelling to and from the locality where his services may have been required. The professional fee will be paid by the Society, but the travelling expenses will be a charge against the applicant. This charge may, however, be reduced or remitted altogether at the discretion of the Council, on such step being recommended to them by the Veterinary Committee.

3. The Inspector, on his return from visiting the diseased stock, will report to the Committee, in writing, the results of his observations and proceedings, which Report will be laid before the Council.

4. When contingencies arise to prevent a personal discharge of the duties confided to the Inspector, he may, subject to the approval of the Committee, name some competent professional person to act in his stead, who shall receive the same rates of remuneration.

II.—Ordinary or Other Cases of Disease.

Members may obtain the attendance of the Veterinary Inspector on any case of disease by paying the cost of his visit, which will be at the following rate, viz., 2*l.* 2*s.* per diem, and travelling expenses. Applications should be addressed to the Principal of the Royal Veterinary College, Camden Town, London, N.W.

III.—Consultations without Visit.

Personal consultation with Veterinary Inspector	10*s.* 6*d.*
Consultation by letter	10*s.* 6*d.*
Post-mortem examination, and report thereon	21*s.*

A return of the number of applications from Members of the Society during each half-year is required from the Veterinary Inspector.

IV.—Admission of Diseased Animals to the Royal Veterinary College, Camden Town, N.W.; Investigations and Reports.

1. All Members of the Society have the privilege of sending cattle, sheep, and pigs to the Infirmary of the Royal Veterinary College, on the following terms; viz., by paying for the keep and treatment of cattle 10*s.* 6*d.* per week each animal, and for sheep and pigs, 3*s.* 6*d.* per week.

No. 2. A detailed Report of the cases of cattle, sheep, and pigs treated in the Infirmary of the College or on Farms in the occupation of Members of the Society, will be furnished to the Council quarterly; and also special reports from time to time on any matter of unusual interest which may come under the notice of the Institution.

By Order of the Council,

H. M. JENKINS, *Secretary.*

Members' Privileges of Chemical Analysis

(Applicable only to the case of Persons who are not commercially engaged in the manufacture or sale of any substance sent for Analysis).

The Council have fixed the following rates of Charges for Analysis to be made by the Consulting Chemist for the *bonâ-fide* and sole use of Members of the Society; who, to avoid all unnecessary correspondence, are particularly requested, when applying to him to mention the kind of analysis they require, and to quote its number in the subjoined schedule. The charge for analysis, together with the carriage of the specimens (if any), must be paid to him by Members at the time of their application:

No. 1.—An opinion of the genuineness and value of bone-dust or oil-cake (each sample) .. .. 5*s.*

„ 2.—An estimate of the value (relatively to the average samples in the market) of sulphate and muriate of ammonia and of the nitrate of potash and soda .. .. 5*s.*

„ 3.—An analysis of guano; showing the proportion of moisture, organic matter, sand, phosphate of lime, alkaline salts and ammonia, and an estimate of its value, provided the selling price of the article to be analysed be sent with it .. .. 10*s.*

„ 4.—An analysis of mineral superphosphate of lime for soluble phosphates only, and an estimate of its value, provided the selling price of the article to be analysed be sent with it .. 5*s.*

„ 5.—An analysis of superphosphate of lime, showing the proportions of moisture, organic matter, sand, soluble and insoluble phosphates, sulphate of lime, and ammonia, and an estimate of its value, provided the selling price of the article to be analysed be sent with it .. .. 10*s.*

„ 6.—An analysis, showing the value of any ordinary artificial manure 10*s.*

„ 7.—An analysis of limestone, showing the proportion of lime .. 7*s.* 6*d.*

„ 8.—An analysis of limestone, showing the proportion of magnesia, 10*s.*; the proportion of lime and magnesia .. .. .. 10*s.*

„ 9.—An analysis of limestone or marls, showing the proportion of carbonate, phosphate, and sulphate of lime and magnesia, with sand and clay .. .. 10*s.*

„ 10.—Partial analysis of a soil, including determinations of clay, sand, organic matter, and carbonate of lime .. .. .. 10*s.*

„ 11.—Complete analysis of a soil £3

„ 12.—An analysis of oil-cake or other substance used for feeding purposes, showing the proportion of moisture, oil, mineral matter, albuminous matter, and woody fibre, as well as of starch, gum, and sugar in the aggregate; and an estimate of its value as compared with pure linseed-cake .. .. 10*s.*

„ 13.—Analysis of any vegetable product .. .. 10*s.*

„ 14.—Analysis of animal products, refuse substances used for manures, &c. .. .. from 10*s.* to £1

„ 15.—Determination of the "hardness" of a sample of water before and after boiling .. .. 5*s.*

„ 16.—Analysis of water of land-drainage, and of water used for irrigation £1

„ 17.—Analysis of water used for domestic purposes .. .. .. £1 10*s.*

„ 18.—Determination of nitric acid in a sample of water .. .. 10*s.*

„ 19.—Personal consultation with the Consulting Chemist. (The usual hours of attendance for the Director, Monday excepted, will be from 11 to 2, but to prevent disappointment, it is suggested that members desiring to hold a consultation with the Director should write to make an appointment) .. 5*s.*

„ 20.—Consultation by letter .. .. 5*s.*

„ 21.—Consultation necessitating the writing of three or more letters 10*s.*

The Laboratory of the Society is at 12, Hanover Square, London, W., to which address the Consulting Chemist, Dr. Augustus Voelcker, F.R.S., requests that all letters and parcels (postage and carriage paid) from Members of the Society, who are entitled to avail themselves of the foregoing Privileges, should be directed.

GUIDE TO THE PURCHASE OF ARTIFICIAL MANURES AND FEEDING STUFFS.

Feeding Cakes.

1. *Linseed-cake* should be purchased as "Pure," and the insertion of this word on the invoice should be insisted upon. The use of such words as "Best," "Genuine," &c., should be objected to by the purchaser.

2. *Rape-cake for feeding purposes* should be guaranteed "Pure" and purchased by sample.

3. *Decorticated Cotton-cake* should be guaranteed "Pure," and purchased by sample.

4. *Undecorticated Cotton-cake* should be guaranteed "Pure," and purchased by sample.

N.B.—All feeding cakes should be purchased in good condition, and the guarantee of the vendor should be immediately checked by a fair sample (taken out of the middle of the cake) being at once sent for examination to a competent analytical chemist. The remainder of the cake from which the sample sent for examination had been taken should be sealed up in the presence of a witness, and retained by the purchaser for reference in case of dispute.

Artificial Manures.

1. *Raw or Green Bones or Bone-dust* should be purchased as "Pure" Raw Bones guaranteed to contain not less than 45 per cent. of tribasic phosphate of lime, and to yield not less than 4 per cent. of ammonia.

2. *Boiled Bones* should be purchased as "Pure" Boiled Bones guaranteed to contain not less than 48 per cent. of tribasic phosphate of lime, and to yield not less than $1\frac{3}{4}$ per cent of ammonia.

3. *Dissolved Bones* are made of various qualities, and are sold at various prices per ton; therefore the quality should be guaranteed, under the heads of *soluble* phosphate of lime, *insoluble* phosphate of lime, and nitrogen or its equivalent as ammonia. The purchaser should also stipulate for an allowance for each unit per cent. which the dissolved bones should be found on analysis to contain less than the guaranteed percentages of the three substances already mentioned.

4. *Mineral Superphosphates* should be guaranteed to be delivered in a sufficiently dry and powdery condition, and to contain a certain percentage of *soluble* phosphate of lime, at a certain price per unit per cent., no value to be attached to *insoluble* phosphates.

5. *Compound Artificial Manures* should be purchased in the same manner and with the same guarantees as Dissolved Bones.

6. *Nitrate of Soda* should be guaranteed by the vendor to contain from 94 to 95 per cent. of pure nitrate.

7. *Sulphate of Ammonia* should be guaranteed by the vendor to contain not less than 23 per cent. of ammonia.

8. *Peruvian Guano* should be sold under that name, and guaranteed to be in a dry and friable condition, and to contain a certain percentage of ammonia.

N.B.—Artificial manures should be guaranteed to be delivered in a sufficiently dry and powdery condition to admit of distribution by the drill. A sample for analysis should be taken, not later than three days after delivery, by emptying several bags, mixing the contents together, and filling two tins holding about half a pound each, in the presence of a witness. Both the tins should be sealed, one kept by the purchaser for reference in case of dispute, and the other forwarded to a competent analytical chemist for examination.

INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES FOR ANALYSIS.

ARTIFICIAL MANURES.—Take a large handful of the manure from three or four bags, mix the whole on a large sheet of paper, breaking down with the hand any lumps present, and fold up in tinfoil, or in oil silk, about 3 oz. of the well-mixed sample, and send it to 12, HANOVER SQUARE, LONDON, W., by post: or place the mixed manure in a small wooden or tin box, which may be tied by string, but must not be sealed, and send it by post. If the manure be very wet and lumpy, a larger boxful, weighing from 10 to 12 oz., should be sent either by post or railway.

Samples not exceeding 4 oz. in weight may be sent by post, by attaching two penny postage stamps to the parcel.

Samples not exceeding 8 oz., for three postage stamps.

Samples not exceeding 12 oz., for four postage stamps.

The parcels should be addressed: DR. AUGUSTUS VOELCKER, 12, HANOVER SQUARE, LONDON, W., and the address of the sender or the number or mark of the article be stated on parcels.

The samples may be sent in covers, or in boxes, bags of linen or other materials. No parcel sent by post must exceed 12 oz. in weight, 1 foot 6 inches in length, 9 inches in width, and 6 inches in depth.

SOILS.—Have a wooden box made 6 inches long and wide, and from 9 to 12 inches deep, according to the depth of soil and subsoil of the field. Mark out in the field a space of about 12 inches square; dig round in a slanting direction a trench, so as to leave undisturbed a block of soil with its subsoil from 9 to 12 inches deep; trim this block or plan of the field to make it fit into the wooden box, invert the open box over it, press down firmly, then pass a spade under the box and lift it up, gently turn over the box, nail on the lid and send it by goods or parcel to the laboratory. The soil will then be received in the exact position in which it is found in the field.

In the case of very light, sandy, and porous soils, the wooden box may be at once inverted over the soil and forced down by pressure, and then dug out.

WATERS.—Two gallons of water are required for analysis. The water, if possible, should be sent in glass-stoppered Winchester half-gallon bottles, which are readily obtained in any chemist and druggist's shop. If Winchester bottles cannot be procured, the water may be sent in perfectly clean new stoneware spirit-jars surrounded by wickerwork. For the determination of the degree of hardness before and after boiling, only one quart wine-bottle full of water is required.

LIMESTONES, MARLS, IRONSTONES, AND OTHER MINERALS.—Whole pieces, weighing from 3 to 4 oz., should be sent enclosed in small linen bags, or wrapped in paper. Postage 2*d.*, if under 4 oz.

OILCAKES.—Take a sample from the middle of the cake. To this end break a whole cake into two. Then break off a piece from the end where the two halves were joined together, and wrap it in paper, leaving the ends open, and send parcel by post. The piece should weigh from 10 to 12 oz. Postage, 4*d.* If sent by railway, one quarter or half a cake should be forwarded.

FEEDING MEALS.—About 3 oz. will be sufficient for analysis. Enclose the meal in a small linen bag. Send it by post.

On forwarding samples, separate letters should be sent to the laboratory, specifying the nature of the information required, and, if possible, the object in view.

H. M. JENKINS, *Secretary.*

Members' Botanical and Entomological Privileges.

The Council have fixed the following Rates of Charge for the examination of Plants, Seeds, and Insects for the *bonâ-fide* use of Members of the Society, who are particularly requested, when applying to the Consulting Botanist, to mention the kind of examination they require, and to quote its number in the subjoined Schedule. The charge for examination must be paid to the Consulting Botanist at the time of application, and the carriage of all parcels must be prepaid.

I. BOTANICAL.

No. 1.—A report on the purity, amount and nature of foreign materials, perfectness, and germinating power of a sample of seeds .. .. 5*s.*

„ 2.—Detailed report on the weight, purity, perfectness, and germinating power of a sample of seeds, with a special description of the weeds and other foreign materials contained in it .. .. 10*s.*

„ 3.—Determination of the species of any weed or other plant, or of any epiphyte or vegetable parasite, with a report on its habits, and the means of its extermination or prevention .. .. 5*s.*

„ 4.—Report on any disease affecting the farm crop .. .. 5*s.*

„ 5.—Determination of the species of a collection of natural grasses found in any district on one kind of soil, with a report on their habits and pasture value .. .. 10*s.*

II. ENTOMOLOGICAL.

„ 6.—Determination of the species of any insect, worm, or other animal which, in any stage of its life, injuriously affects the farm crops, with a report on its habits and suggestions as to its extermination .. .. 5*s.*

INSTRUCTIONS FOR SELECTING AND SENDING SPECIMENS.

In sending seed or corn for examination the utmost care must be taken to secure a fair and honest sample. If anything supposed to be injurious or useless exists in the corn or seed, selected samples should also be sent.

In collecting specimens of plants, the whole plant should be taken up, and the earth shaken from the roots. If possible, the plant must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel.

Specimens of diseased plants or of parasites should be forwarded as fresh as possible. Place them in a bottle, or pack them in tin-foil or oil-silk.

All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstances (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry.

N.B.—*The above Scale of Charges is not applicable in the case of Seedsmen requiring the services of the Consulting Botanist.*

Parcels or letters (Carriage or Postage prepaid) to be addressed to Mr. W. Carruthers, F.R.S., 4, Woodside Villas, Gipsy Hill, London, S.E.

H. M. JENKINS, *Secretary.*

Royal Agricultural Society of England.

1879–80.

President.

THE DUKE OF BEDFORD.

Trustees.

Year when Elected.	
1855	ACLAND, Sir THOMAS DYKE, Bart., M.P., *Sprydoncote, Exeter, Devonshire.*
1857	BRIDPORT, General Viscount, *Cricket St. Thomas, Chard, Somersetshire.*
1850	CHESHAM, Lord, *Latimer, Chesham, Bucks.*
1861	DENT, J. D., *Ribston Hall, Wetherby, Yorkshire.*
1863	KINGSCOTE, Colonel, M.P., *Kingscote, Wotton-under-Edge, Gloucestershire.*
1868	LICHFIELD, Earl of, *Shugborough, Staffordshire.*
1854	MACDONALD, Sir ARCHIBALD KEPPEL, Bt., *Woolmer Lodge, Liphook, Hants.*
1860	MARLBOROUGH, Duke of, K.G., *Blenheim Park, Oxford.*
1839	PORTMAN, Viscount, *Bryanston, Blandford, Dorset.*
1856	POWIS, Earl of, *Powis Castle, Welshpool, Montgomeryshire.*
1858	RUTLAND, Duke of, K.G., *Belvoir Castle, Grantham, Leicestershire.*
1861	WELLS, WILLIAM, *Holmewood, Peterborough, Northamptonshire.*

Vice-Presidents.

1873	BEDFORD, Duke of, *Woburn Abbey, Bedfordshire.*
1861	CATHCART, Earl, *Thornton-le-Street, Thirsk, Yorkshire.*
1839	CHICHESTER, Earl of, *Stanmer Park, Lewes, Sussex.*
1867	DEVONSHIRE, Duke of, K.G., *Holker Hall, Lancashire.*
1847	EVERSLEY, Viscount, *Heckfield Place, Winchfield, Hants.*
1848	GIBBS, Sir BRANDRETH, *Halfmoon Street, Piccadilly, London, W.*
1858	KERRISON, Sir EDWARD C., Bart., *Brome Hall, Scole, Suffolk.*
1848	LAWES, JOHN BENNET, *Rothamsted, St. Albans, Herts.*
1852	RICHMOND AND GORDON, Duke of, K.G., *Goodwood, Chichester, Sussex.*
1872	SKELMERSDALE, Lord, *Lathom Hall, Ormskirk, Lancashire.*
1859	VERNON, Lord, *Sudbury Hall, Derby.*
1855	WYNN, Sir WATKIN WILLIAMS, Bart., M.P., *Wynnstay, Ruabon, Denbighshire.*

Other Members of Council.

1858	AMOS, CHARLES EDWARDS, 5, *Cedars Road, Clapham Common, Surrey.*
1877	ARKWRIGHT, J. H., *Hampton Court, Leominster, Herefordshire.*
1875	AVELING, THOMAS, *Rochester, Kent.*
1875	AYLMER, HUGH, *West Dereham, Stoke Ferry, Norfolk.*
1863	BOWLY, EDWARD, *Siddington House, Cirencester, Gloucestershire.*
1861	CANTRELL, CHARLES S., *Riding Court, Datchet (Bucks), Windsor.*
1874	CHANDOS-POLE-GELL, H., *Hopton Hall, Wirksworth, Derbyshire.*
1878	DAVIES, DAVID REYNOLDS, *Agden Hall, Lymm, Cheshire.*
1860	DRUCE, JOSEPH, *Eynsham, Oxford.*
1868	EDMONDS, WILLIAM JOHN, *Southrop, Lechlade, Gloucestershire.*
1871	EGERTON, Hon. WILBRAHAM, M.P., *Rostherne Manor, Knutsford, Cheshire.*
1873	EVANS, JOHN, *Uffington, Shrewsbury, Salop.*
1876	FEVERSHAM, Earl of, *Duncombe Park, Helmsley, Yorkshire.*
1879	FOSTER, S. P., *Killhow, Carlisle, Cumberland.*

Year when Elected.	
1875	FRANKISH, WILLIAM, *Limber Magna, Ulceby, Lincolnshire.*
1879	GORRINGE, HUGH, *Kingston-by-Sea, Shoreham, Sussex.*
1874	HEMSLEY, JOHN, *Shelton, Newark, Notts.*
1876	HOWARD, CHARLES, *Biddenham, Bedford.*
1878	HOWARD, JAMES, *Clapham Park, Bedfordshire.*
1871	JONES, J. BOWEN, *Ensdon House, Montford Bridge, R.S.O., Salop.*
1869	LEEDS, ROBERT, *Keswick Old Hall, Norwich.*
1872	LEICESTER, Earl of, K.G., *Holkham Hall, Wells, Norfolk.*
1874	LINDSAY, Colonel LOYD, M.P., *Lockinge Park, Wantage, Berkshire.*
1865	LOPES, Sir MASSEY, Bart., M.P., *Maristow, Roborough, Devon.*
1871	MCINTOSH, DAVID, *Havering Park, Romford, Essex.*
1874	MARTIN, JOSEPH, *Highfield House, Littleport, Isle of Ely, Cambridgeshire.*
1871	MASFEN, R. HANBURY, *Pendeford, Wolverhampton, Staffordshire.*
1879	NEVILLE, ROBERT, *Butleigh Court, Glastonbury, Somersetshire.*
1878	ODAMS, JAMES, *The Grange, Bishop Stortford, Herts.*
1857	PAIN, THOMAS, *The Grove, Basingstoke, Hants.*
1861	RANDELL, CHARLES, *Chadbury, Evesham, Worcestershire.*
1875	RANSOME, ROBERT CHARLES, *Ipswich, Suffolk.*
1867	RAVENSWORTH, Earl of, *Ravensworth Castle, Durham.*
1871	RAWLENCE, JAMES, *Bulbridge, Wilton, Salisbury, Wilts.*
1869	RIDLEY, Sir M. WHITE, Bart., M.P., *Blagdon, Cramlington, Northumberland.*
1875	RUSSELL, ROBERT, *Horton Court Lodge, Dartford.*
1874	SANDAY, GEORGE HENRY, *Wensley House, Bedale, Yorkshire.*
1878	SHERATON, WILLIAM, *Broom House, Ellesmere, Salop.*
1856	SHUTTLEWORTH, JOSEPH, *Hartsholme Hall, Lincoln.*
1874	SPENCER, Earl, K.G., *Althorpe, Northampton.*
1875	STRATTON, RICHARD, *The Duffryn, Newport, Monmouthshire.*
1873	TORR, JOHN, M.P., *Carlett Park, Eastham, Cheshire.*
1874	TURBERVILL, Lieut.-Col. PICTON, *Ewenny Priory, Bridgend, South Wales.*
1845	TURNER, GEORGE, *Great Bowley, Tiverton, Devonshire.*
1871	TURNER, JABEZ, *Norman Cross, Yaxley, Huntingdonshire.*
1871	WAKEFIELD, WILLIAM H., *Sedgwick, Kendal, Westmoreland.*
1870	WELBY-GREGORY, Sir WILLIAM EARLE, Bart., M.P., *Denton Hall, Grantham, Lincolnshire.*
1870	WHITEHEAD, CHARLES, *Barming House, Maidstone, Kent.*
1865	WILSON, JACOB, *Woodhorn Manor, Morpeth, Northumberland.*
1878	WISE, GEORGE, *Woodcote, Warwick.*

Secretary and Editor.

H. M. JENKINS, 12, *Hanover Square, London*, W.

Consulting Chemist—Dr. AUGUSTUS VOELCKER, F.R.S., 12, *Hanover Square*, W.
Consulting Botanist—W. CARRUTHERS, F.R.S., F.L.S., *British Museum*, W.C.
Consulting Veterinary Surgeon—Professor JAMES BEART SIMONDS, *Royal Veterinary College, Camden Town*, N.W.
Veterinary Inspectors—THE OFFICERS OF THE ROYAL VETERINARY COLLEGE.
Consulting Engineers—EASTONS & ANDERSON, 3, *Whitehall Place*, S.W.
Surveyor—GEORGE HUNT, *Evesham, Worcestershire.*
Seedsmen—THOMAS GIBBS and Co., *Corner of Halfmoon Street, Piccadilly*, W.
Publisher—JOHN MURRAY, 50, *Albemarle Street*, W.
Bankers—THE LONDON AND WESTMINSTER BANK, *St. James's Square Branch*, S.W.

STANDING COMMITTEES FOR 1879.

Finance Committee.

KINGSCOTE, Colonel (Chairman).
BRIDPORT, General Viscount.
RIDLEY, Sir M. WHITE, Bt.
DAVIES, D. R.
FRANKISH, W.
RANDELL, CHARLES.
SHUTTLEWORTH, J.

House Committee.

KINGSCOTE, Colonel (Chairman).
THE PRESIDENT.
CHAIRMAN of Finance Committee.
BRIDPORT, General Viscount.
GIBBS, Sir BRANDRETH.
CANTRELL, C. S.

Journal Committee.

DENT, J. D. (Chairman).
CATHCART, Earl.
WELBY-GREGORY, Sir W. E., Bt.
RIDLEY, Sir M. WHITE, Bt.
CHANDOS-POLE-GELL, H.
FRANKISH, W.
HEMSLEY, J.
HOWARD, J.
JONES, J. BOWEN.
KINGSCOTE, Colonel.
RANSOME, R. C.
TURBERVILL, Lieut.-Col.
WELLS, W.
WHITEHEAD, CHARLES.
WISE, G.

Chemical Committee.

WELLS, WILLIAM (Chairman).
BEDFORD, Duke of.
LICHFIELD, Earl of.
VERNON, Lord.
MACDONALD, Sir A. K., Bart.
WELBY-GREGORY, Sir W. E., Bt.
ARKWRIGHT, J. H.
AVELING, T.
CARRUTHERS, W.
DENT, J. D.
EDMONDS, W. J.
HOWARD, C.
JONES, J. BOWEN.
LAWES, J. B.
TUBERVILL, Lieut.-Col.
VOELCKER, Dr. A.
WAKEFIELD, W. H.
WARREN, R. A.
WHITEHEAD, CHARLES.

Seeds and Plant-Diseases Committee.

WHITEHEAD, CHARLES (Chairman).
VERNON, Lord.
WELBY-GREGORY, Sir W. E., Bt.
GIBBS, Sir BRANDRETH.
ARKWRIGHT, J. H.
CARRUTHERS, W.
FRANKISH, W.
JONES, J. BOWEN.
TURBERVILL, Lieut.-Col.
VOELCKER, Dr.

Veterinary Committee.

EGERTON, Hon. WILBRAHAM (Chairman).
CATHCART, Earl.
BRIDPORT, General Viscount.
RIDLEY, Sir M. WHITE, Bt.
GIBBS, Sir BRANDRETH.
BROWN, Professor.
CHANDOS-POLE-GELL, H.
DAVIES, D. R.
DUGUID, W.
FLEMING, GEORGE.
GREENFIELD, Dr. WM. SMYTH.
HARPLEY, M. J.
KINGSCOTE, Colonel.
ODAMS, JAMES.
SANDAY, G. H.
SANDERSON. Dr. J. BURDON.
SIMONDS, Professor.
WAKEFIELD, W. H.
WELLS, WILLIAM.
WILSON, JACOB.

Stock-Prizes Committee.

CHANDOS POLE-GELL, H. (Chairman).
SPENCER, Earl.
BRIDPORT, Gen. Visct.
GIBBS, Sir BRANDRETH.
ARKWRIGHT, J. H.
AYLMER, H.
BOWLY, EDWARD.
DAVIES, D. R.
EVANS, JOHN.
FRANKISH, W.
HEMSLEY, J.
HOWARD, C.
MCINTOSH, D.
MASFEN, R. H.
PAIN, T.
SANDAY, G. H.
SHERATON, W.
SIMONDS, Prof.
STRATTON, R.
TORR, J.
TURNER, GEO.
WAKEFIELD, W. H.
WILSON, JACOB.
WISE, G.
The Stewards of Live Stock.

Implement Committee.

Hemsley, J. (Chairman).
Bridport, Gen. Viscount.
Vernon, Lord.
Gibbs, Sir Brandreth.
Anderson, W.
Aveling, T.
Cantrell, Chas. S.
Edmonds, W. J.
Frankish, W.
Howard, J.
Jones, J. Bowen.
Martin, J.
Ransome, R. C.
Sanday, G. H.
Sheraton, W.
Shuttleworth, Joseph.
Simonds, Prof.
Stratton, R.
Turbervill, Lieut.-Col.
Turner, Jabez.
Whitehead, Charles.
Wilson, Jacob.
The Stewards of Implements.

General London Exhibition Committee.

Kingscote, Col. (Chairman).
Bridport, Gen. Viscount.
Chesham, Lord.
Grosvenor, Lord R.
Skelmersdale, Lord.
Egerton, Hon. W.
Gibbs, Sir Brandreth.
Allender, G. M.
Aveling, T.
Aylmer, H.
Bowly, E.
Cantrell, Charles S.
Chandos-Pole-Gell, H.
Davies, D. R.
Frankish, W.
Gilbey, Walter.
Hadley, Alderman.
Hambro, Charles.
Howard, C.
Hemsley, J.
Jones, J. Bowen.
McIntosh, D.
Martin, J.
Masfen, R. H.
Mayor, The Rt. Hon. the Lord.
Pain, T.
Randell, Charles.
Ransome, R. C.
Rawlence, J.
Russell, R.
Sanday, G. H.
Shuttleworth, J.
Simonds, Professor.
Soulsby, W. J.
Staples, Alderman and Sheriff.
Stratton, R.
Turbervill, Lieut.-Col.
Turner, Jabez.
Wakefield, W. H.
Wells, W.
Whitehead, Charles.
Wilson, Jacob.

Show-Yard Contracts Committee.

Wilson, Jacob (Chairman).
Bridport, General Viscount.
Gibbs, Sir Brandreth.
Amos, C. E.
Aveling, T.
Chandos-Pole-Gell, H.
Frankish, W.
Hemsley, J.
Howard, C.
Randell, Charles.
Shuttleworth, Joseph.
Stratton, R.

Committee of Selection.

Cathcart, Earl (Chairman).
Bridport, General Viscount.
Chandos-Pole-Gell, H.
Dent, J. D.
Hemsley, J.
Kingscote, Colonel.
Wilson, Jacob.

And the Chairmen of the Standing Committees.

Education Committee.

Bedford, Duke of (Chairman).
Aveling, T.
Carruthers, W.
Dent, J. D.
Jones, J. Bowen.
Kingscote, Colonel.
Turbervill, Lieut.-Col.
Voelcker, Dr.
Whitehead, Charles.
Wise, G.

Cattle Plague Committee.

The whole Council.

*** The President, Trustees, and Vice-Presidents are Members *ex officio* of all Committees.

Royal Agricultural Society of England.

GENERAL MEETING,

12, Hanover Square, Thursday, May 22nd, 1879.

REPORT OF THE COUNCIL.

The Council of the Royal Agricultural Society have the gratification of reporting that a large accession to the list of Members has been obtained since the last General Meeting in December, no fewer than 3 Governors and 677 Members having been elected in the interval. On the other hand, the death of 2 Governors and 47 Members has been reported, and the names of 96 Members, who resigned in the course of the year 1878, have been removed from the list. The Society now consists of—

81 Life Governors,
72 Annual Governors,
2453 Life Members,
4700 Annual Members,
26 Honorary Members,

making a total of 7332, and showing an increase of 535 Members since the December Meeting.

In the last Half-yearly Report the Council announced the resignation of Mr. Milward, of Thurgarton Priory, Notts, as a Trustee of the Society, and they much regret that they now have to report the death of their valued colleague, who had been a most active Member of Council for more than 30 years.

The vacancy in the list of Vice-Presidents, which existed in December, has been filled up by the election of Mr. John Bennet Lawes, F.R.S., of Rothamsted; and the vacancies in the Council have been filled up by the election of Mr. Samuel Porter Foster, of Kilhow, Carlisle, and Mr. Robert Neville, of Butleigh Court, Glastonbury.

The accounts for the year 1878 have been examined, and

certified by the Auditors and Accountants of the Society, and have been published in the last number of the 'Journal,' together with the statement of receipts and expenditure connected with the Bristol Meeting. The funded property of the Society has since been reduced by the sum of 2081*l.* 4*s.* 5*d.* New Three per Cents., which has been sold out to meet some of the preliminary expenses of the London Exhibition; and it now stands at 24,430*l.* 7*s.* New Three per Cents. The balance of the current account in the hands of the Soctety's bankers, on the 1st instant, was 7222*l.* 17*s.* 8*d.*

The London International Exhibition will commence on June 30th, and will continue for the six following days (Sunday excepted). It will be the largest and most varied Agricultural Show hitherto held, as the Council have taken the opportunity to include in the Exhibition some novel features of great interest. Among these, it may be stated that the idea of a Comparative Loan Collection of Ancient and Modern Farm Implements has been well supported; and the thanks of the Council and of the Members are due alike to the possessors of the old and the makers of the new forms of implements for their ready response to the appeal of the Council to aid them in this matter. It is intended to publish a special descriptive Catalogue of this Loan Collection, which will doubtless be a valuable aid to the study of the history of Farming Machinery.

The processes of Foreign Dairy Manufacture have recently attracted so much attention, in consequence of the large importations of Foreign Cheese and Butter during the last few years, that the Council have endeavoured to secure the representation of some Foreign as well as English dairy processes in actual operation; and they are glad to state that the German, Scandinavian, and French, in addition to some of the English, processes will be represented in an International Dairy in the forthcoming Exhibition.

The Implement Industry of the country will be represented by an unusually large number of Exhibitors, while special novelties will be contributed by French, Belgian, and German makers. National collections of the agricultural produce of several countries will also form a special feature of interest and instruction.

Three Railway Waggons have been entered to compete for

the Gold Medal and Fifty Pounds Prize offered by the Mansion House Committee for the best Waggon for conveying perishable goods—such as Meat, Poultry, Fish, &c., by railway, at a low temperature, a journey of 500 miles, the waggons to retain their contents at a temperature not exceeding 45° Fahr., for six days.

The Exhibition of Live Stock will be on a scale of equal magnitude with that of Implements in both the Foreign and English Sections. The Council have taken the utmost precautions to prevent any importation of disease with Foreign Cattle, which will be placed in a portion of the Exhibition quite separate from the English Cattle Department. Under special Orders issued by the Privy Council, suitable premises have been engaged as Quarantine Stations, and arrangements will be made for the inspection of all animals entered for exhibition previous to shipment and after landing, as well as on their arrival at the Exhibition after having undergone the period of Quarantine required by the Privy Council.

The Council have much pleasure in calling attention to the support which has been given to the London Meeting by the several Agricultural Stud and Herd Book Societies and similar Associations, most of which have offered Champion or Special Prizes for animals of the Breeds in which they are respectively interested. The co-operation of such Institutions with the Royal Agricultural Society must, in the opinion of the Council, have a great influence in promoting the objects which are common to both.

The district assigned for the Country Meeting of 1880 comprises the counties of Northumberland, Durham, Cumberland, and Westmoreland; and the Council have decided to accept the very cordial invitation which they received from the Mayor and Corporation of Carlisle, to hold the Country Meeting of next year in that city.

The Council have selected for the Country Meeting of 1881 the district comprising the counties of Derby, Leicester, Lincoln, Northampton, Nottingham, and Rutland.

As reported at the last Half-yearly Meeting, the Council have provided a Laboratory for the Consulting Chemist on the Society's premises, and have entered into a new arrangement with Dr. Voelcker, whereby the cost of analyses to Members,

under certain regulations, has been reduced to about one-half of the previous rates. A statement of these and other revised privileges having been sent to each Member of the Society, the Council have the satisfaction of reporting that since the opening of the new Laboratory a very large addition to the number of samples usually sent by Members during the same period of the year has been received for analysis by Dr. Voelcker.

The Council have further made a new arrangement with the Governors of the Royal Veterinary College, by virtue of which the officers of that Institution will act as Veterinary Inspectors to the Society on terms similar to those which have hitherto been paid by the Members for professional aid in cases of disease of Cattle, Sheep, and Pigs. This arrangement has worked very satisfactorily during the few months that it has been in operation, and the Reports from the Professors of the College, on the principal cases which have come under their observation, which are published in the Proceedings of the Monthly Council Meetings, are deserving of the careful study of all Stock-owners.

In consequence of the arrival at Liverpool of a number of Cattle from the United States of America affected with Pleuro-pneumonia, the Council urged upon the Government the importance of immediately placing the United States under the provisions of the Contagious Diseases (Animals) Act (1878), which provides for the slaughter of Foreign animals at the place of landing, and an Order in Council with that object was issued shortly after.

Of the Graduates of the Royal College of Veterinary Surgeons who were eligible to compete for the Society's Medals and Prizes, offered for proficiency in Cattle Pathology, only one (Mr. John Herbert Callow) presented himself for examination last January. The Examiners awarded him the Gold Medal and First Prize of 20*l*. The Examiners reported that, in their opinion, the absence of competitors was in consequence of the conditions of qualification for competition being too stringent; and the Council of the Royal College of Veterinary Surgeons having taken the same view, it has been arranged that in future the competition shall be open to Candidates who have taken honours in Cattle Pathology at the final examination of the College, and who shall have taken their diploma not more than two years before the date of the examination.

Twelve Candidates presented themselves at the recent Examination for the Society's Prizes and Certificates; but only three satisfied the Examiners in all the necessary subjects, thereby gaining the first-class certificates and life-membership of the Society, as well as qualifying themselves to earn payments as teachers of the principles of agriculture under the Departments of Science and Art. The successful Candidates were:—A. E. Brooke Hunt, first-class certificate, life-membership, prize of 25*l.* (educated at Cirencester); Lawford D. Gover, first-class certificate, life-membership, prize of 15*l.* (educated at Cirencester); Robert Wallace, first-class certificate, life-membership, prize of 10*l.* (educated at Edinburgh).

Upon the representation of the Council, the Science and Art Department of the Committee of Council on Education have agreed to accept the diploma of the Royal Agricultural College, Cirencester, and the first-class certificate of the Royal Agricultural Society, as qualifying the holders to earn payments on the results of their instruction in the Principles of Agriculture without their undergoing a special examination for that purpose.

By order of the Council,

H. M. Jenkins, *Secretary.*

ROYAL AGRICULTURAL

Dr. Half-yearly Cash Account

	£ s. d.	£ s. d.
To Balance in hand, 1st January, 1879:—		
Bankers	95 10 7	
Secretary	105 3 0	
		200 13 7
To Sale of Stock		2,000 0 0
To Income:—		
Dividends on Stock	358 16 5	
Subscriptions:—		
Governors' Life Compositions	£. s. d. 95 0 0	
Governors' Annual	355 0 0	
Members' Life-Compositions	1766 0 0	
Members' Annual	3971 2 0	
	6,187 2 0	
Establishment:—		
Rent	100 0 0	
Journal:—		
Advertisements	53 1 9	
Veterinary:—		
Professional Fees	23 16 6	
Bristol Meeting	95 4 0	
Total Income		6,818 0 8
To London Exhibition		15,619 19 0
		£24,637 13 3

Balance-Sheet,

LIABILITIES.	£ s. d.	£ s. d.
To Capital:—		
Surplus, 31st December, 1878	31,997 0 2	
Surplus of Income over Expenditure during the Half-year, viz.:—	£ s. d.	
Income	6,818 0 8	
Expenditure	4,943 9 5	
	1,874 11 3	
		33,871 11 5
Less half-year's interest and depreciation on Country Meeting Plant		127 6 3
		£33,744 5 2

QUILTER, BALL, CROSBIE, GLEGG, & WELTON, *Accountants.*

SOCIETY OF ENGLAND.

FROM 1ST JANUARY TO 24TH JUNE, 1879. — CR.

	£ s. d.	£ s. d.	£ s. d.
By Expenditure:—			
Establishment:—			
Salaries, Wages, &c.	692 10 0		
House:—Rent, Taxes, Repairs, &c.	459 1 3		
Office:—Printing, Postage, Stationery, &c.	397 8 7		
		1,548 19 10	
Journal:—			
Printing and Stitching	685 13 9		
Postage and Delivery	210 0 0		
Literary Contributions	284 5 0		
Woodcuts	65 14 6		
		1,245 13 3	
Chemical:—			
Grant for Investigations 1878	200 0 0		
Salaries	272 3 0		
On Account of erecting Laboratory	514 15 0		
Chemical Apparatus	300 0 0		
Furniture, &c.	81 18 6		
		1,368 16 6	
Veterinary:—			
The Brown Institution for Investigations to June 24, 1879.	125 0 0		
Prizes and Medals	30 7 0		
Fees to Examiners	21 15 0		
Professional Fees to Royal Veterinary College	22 15 6		
		199 17 6	
Botanical:—			
Consulting Botanist's Salary		50 0 0	
Education:—			
Fees to Examiners	52 10 0		
Printing	18 4 6		
Advertising	18 3 6		
Prizes	50 0 0		
		138 18 0	
Subscriptions (paid in error) returned		12 1 0	
Sundries		34 13 11	
Farm Prizes:—			
Advertising, &c.		69 15 9	
Bristol Meeting		274 13 8	
Total Expenditure			4,943 9 5
By Country Meeting Plant			32 11 0
By London Exhibition			17,856 15 4
			22,832 15 9
By Balance in hand, 24th June:—			
Bankers		1,804 4 5	
Secretary		13 1	
			1,804 17 6
			£24,637 13 3

24TH JUNE, 1879.

ASSETS.	£ s. d.	£ s. d.
By Cash in hand	1,804 17 6	
By New 3 per Cent. Stock 24,430*l.* 7*s.* 0*d.* cost*	23,340 7 1	
By Books and Furniture in Society's House	1,451 17 6	
By Country Meeting Plant	1,670 7 0	
		28,267 9 1
At debit of London Exhibition		5,476 16 1
		£33,744 5 2

* *Value at* 96¾ = £23,636 7*s.* 3*d.*

Mem.—The above Assets are exclusive of the amount recoverable in respect of arrears of Subscription to 24th June, 1879, which at that date amounted to 1382*l.*

Examined, audited, and found correct, this 8th day of September, 1879.

FRANCIS SHERBORN,
A. H. JOHNSON,
HENRY CANTRELL. } *Auditors on behalf of the Society.*

LONDON INTERNATIONAL EXHIBITION, 1879.

STEWARDS OF DEPARTMENTS.

Implements.

G. H. Sanday.
W. Frankish.
Robert Neville.
J. Hemsley.

Stock.

William Wells.
Lt.-Col. Picton-Turbervill,
Charles Whitehead.
Charles Howard.

Butter, Cheese, &c.

Sir A. K. Macdonald, Bart.

Provisions.

James Odams.

Hops.

Charles Whitehead.

Foreign Department.

Lord Vernon. H. Chandos-Pole-Gell. George Wise.

Forage.

G. M. Allender.

General Arrangements.

Jacob Wilson.

JUDGES OF STOCK.

HORSES, &c.

Agricultural.

J. L. Curtis,
William Thomas Lamb,
Alexander Turnbull.

Clydesdales.

Adam Smith,
John Thomi'son,
John Young.

Suffolks.

Daniel Sewell,
William Thomi'son,
Henry Cross.

Hunters.

John B. Booth,
John Hill,
Col. Luttrell.

Hackneys, &c.

Alfred Ashworth,
Henry Beevor,
William Parker.

Asses and Mules.

W. Lort,
M. de Maichin.

Foreign Draught Horses.

Col. F. Barlow,
H. W. Crommelin,
M. Lavalard.

Foreign Riding Horses.

Comte de Bouillé,
M. Ronna,
Count Schlieffen.

CATTLE.

Shorthorns.

RICHARD CHALONER,
G. DREWRY,
A. MITCHELL.

Herefords.

JOHN CRANE,
FRANCIS EVANS,
H. HAYWOOD.

Devons.

W. BULLEN,
SAMUEL P. NEWBURY,
JOHN OVERMAN.

Sussex, Norfolk, and Suffolk Polled.

THOMAS FULCHER,
JOHN NOAKES,
JOSIAH PITCHER.

Longhorns, Welsh, &c.

J. H. BURBERY,
ROWLAND HUGHES,
W. B. ROBERTS.

Jerseys and Guernseys.

WALTER GILBEY,
C. P. LE CORNU,
C. STEPHENSON.

Ayrshires, Kerry, and Dairy Cattle.

ANDREW ALLEN,
WILLIAM T. CARRINGTON,
LUKE CHRISTY.

Galloways, Angus, and West Highlands.

THOMAS FERGUSON,
T. GIBBONS,
D. M'DIARMID.

Foreign Shorthorns, Charolais, Garronais, Limousin, &c.

J. K. FOWLER,
M. TIERSONNIER.

Norman, Breton, Swiss, Dutch, &c.

M. AKKERMAN,
JULIEN DE FELCOURT,
WM. STRATTON.

Angeln, Jutland, Schleswig Holstein.

M. BREINHOLT,
PROF. WILSON,
J. FRIES.

SHEEP.

Leicesters and Lincolns.

T. CASSWELL,
EDWARD PADDISON,
WM. SANDAY.

Border Leicesters, Cheviots, and Roscommons.

GEORGE REA,
WM. SMITH,
JOHN USHER.

Oxfordshire Downs.

JOHN BRYAN,
JAMES P. CASE.

Cotswolds, Kentish, Devons, and other Long Wools.

R. L. COBB,
ROBERT GARNE,
AMBROSE WARDE.

Southdowns, Hampshires, and other Short Wools.

EDWARD LITTLE,
HENRY OVERMAN,
JOHN A. HEMPSON.

Shropshires.

JOHN EVANS,
R. H. MASFEN,
THOMAS WILLIAMS.

Black-faced Mountain, Herdwicks, Lonks, and Welsh Mountains.

EDWARD EDWARDS,
JOHN INGLEBY,
JOHN IRVING.

Rylands, Somersets, Exmoors, Dorsets, Dartmoors, and Limestones.

JOHN HOGARTH,
J. W. PAULL,
JOHN TAPP.

Foreign Sheep.

M. DUTERTRE,
HUGH GORRINGE,
M. F. R. DE LA TREHONNAIS.

GOATS.

WALTER FREEMAN,
H. S. HOLMES-PEGLER.

PIGS.

JOHN ANGUS,
JOHN LYNN,
JOSEPH SMITH.

INSPECTORS OF SHEARING.

W. Jobson, | J. E. Rawlence, | J. B. Workman.

JUDGE OF WOOL.

R. Woodford Goddard.

JUDGES OF BUTTER.

Scandinavian, &c.

G. W. Burrows, | James Watson, | A. M. Delalonde.

Other Kinds.

J. T. Peacock, | Prof. Segelcke, | B. Laming.

JUDGES OF CHEESE.

English, American, and other British Makes.

S. W. Cox, | James Hudson, | T. Rigby.

French and other Foreign Makes.

Mr. Fritz de Vries, | Vicomte De Neuville, | M. Pratt.

JUDGES OF HAMS, BACON, &c.

J. Kleinwort, | Richard H. Thompson.

JUDGES OF CIDER AND PERRY.

H. C. Beddoe, | W. Gaymer, | Thomas Maye.

JUDGES OF HOPS.

W. Gridley, | J. T. Noakes, | M. Trier.

JUDGES OF IMPLEMENTS.

Railway Waggons.

J. K. Fowler, | A. Tindall, | John Wheatley.

Miscellaneous.

J. A. Barral, | W. Cranfield, | J. W. Kimber.

JUDGES OF FARM PLANS.

J. Bailey Denton, | Thomas Sample, | Halifax Wyatt.

FARM JUDGES.

Sewage Farms.

Baldwin Latham, | Clare Sewell Read, M.P., | T. H. Thursfield.

Market Gardens, and Market Garden Farms.

W. Earley, | Charles Whitehead.

JUDGES OF BEES, HIVES, AND HONEY.

William Carr, | Thomas W. Cowan, | Rev. George Raynor.

AWARDS OF PRIZES.

NOTE.—The Judges were instructed, in addition to awarding the Prizes, to designate as the *Reserve Number* one animal in each Class, next in order of merit, if it possessed sufficient for a Prize; in case an animal to which a Prize was awarded should subsequently become disqualified.

Prizes given by the Mansion House Committee are marked thus (*).

HORSES.

Agricultural Stallions—Four Years old and upwards.

THE EARL OF ELLESMERE, Worsley Hall, Manchester: FIRST PRIZE, 50*l.*, for "British Wonder," chestnut, 4 years-old; bred by Mr. Beart, Downham Market; sire, Marston's "England's Wonder."

LAWRENCE DREW, of Merryton, Hamilton, Lanarkshire: SECOND PRIZE, 20*l.*, for "Lord Harry," black, 5 years-old; bred by himself; sire, "Prince of Wales;" dam, "Mary."

GEORGE HERBERT MORRELL, Headington Hill Hall, Oxford: THIRD PRIZE, 10*l.*, for dark-blue roan, 5 years-old; bred by Mr. Clift, Weeden Hill, Aylesbury; sire, "King of the Valley;" dam, "Flower."

CAPTAIN WILLIAM HAMMOND BETTS, Frenze Hall, Diss, Norfolk: the *Reserve Number*, to "Sir John Falstaff," dark iron-grey, 6 years-old; breeder unknown; sire, "Wiseman's Wonder;" dam by Taylor's "England's Glory."

Agricultural Stallions—Three Years old.

THE EARL OF ELLESMERE, Worsley Hall, Manchester: FIRST PRIZE, 50*l.*, and the CHAMPION CUP,† value 25*l.*, for "Young Prince of the Isle," bay; bred by Mr. Fryer, Chatteris; sire, "Prince of the Isle;" dam by Welcher's "Honest Tom:" and SECOND PRIZE, 20*l.*, for "Samson III.," bay; bred by Mr. Child, Chatteris, Cambs; sire "Samson;" dam by Osborne's "Young England's Glory."

RICHARD TOWERTON, Cuxham, Tetsworth, Oxon., THIRD PRIZE, 10*l.*, for "King of the Vale," bay: bred by Mr. Charles Shrimpton, Tetsworth, Oxon; sire, "King of the Valley;" dam, "Brighton."

† Given by the Earl of Ellesmere, President of the English Cart Horse Society, for the best stallion in the two first classes.

The Earl of Ellesmere, Worsley Hall: the *Reserve Number* to "Crown Prince," bay; bred by Mr. Fryer, Chatteris, Cambs; sire, Daintree's "Grand Prince;" dam by Engledon's "Farmer's Friend."

Agricultural Stallions—Two Years old.

The Earl of Ellesmere, Worsley Hall: First Prize, 50*l.*, and the Champion Cup,† value 25*l.*, for "Samson IV.," bay; bred by himself; sire, "Samson;" dam by Welcher's "Honest Tom."

The Stand Stud Company, Whitefield, Manchester: Second Prize, 20*l.*, for "British Simon," brown; bred by Mr. Jenkinson, Nateby; sire, "Simon Pure;" dam by Shaw's "British Ensign."

Frederick Street, Somersham Park, St. Ives, Hunts: Third Prize, 10*l.*, for "Somersham Samson," bay; bred by himself; sire, Earl of Ellesmere's "Young Samson;" dam, "Brisk."

The Duke of Westminster, K.G., Eaton, Chester: the *Reserve Number* to "Prince Victor," brown; breeder unknown; sire, "King Victor."

Agricultural Stallions—One Year old.

James Johnstone, Lochburnie, Maryhill, Glasgow, N.B.: First Prize, 20*l.*, for "Lord Douglas," dark brown; bred by Mr. Lawrence Drew, Merryton, Hamilton; sire, "Prince of Wales" (673); dam, "Jessie Brown."

The Earl of Ellesmere, Worsley Hall: Second Prize, 10*l.*, for "Great Britain," bay; bred by himself; sire, "Samson II.;" dam by Welcher's "Honest Tom."

Lawrence Drew, Merryton, Hamilton, N.B.: Third Prize, 5*l.*, for his black; breeder unknown; sire, "Lincolnshire Lad."

Alfred Richardson, Fortrey House, Mepal, Ely, Cambs: the *Reserve Number* to "Fortrey Samson," bay; bred by Mr. William Lyon, Park Street, Chatteris, Cambs; sire, "Samson 2nd;" dam, "Flowers," by Osborne's "Young England's Glory."

Clydesdale Stallions—Four Years old and upwards.

David Buchanan, Garscadden Mains, New Kilpatrick, Dumbarton: First Prize, 50*l.*, and the Champion Cup,‡ value 25*l.*, for "Druid," brown, 4 years-old; bred by Mr. James Milroy, Galdenoch, Stranraer; sire, "Farmer" (286); dam, "Tibbie," by "Vanquisher" (890).

David Riddell, Blackhall, Paisley, N.B.: Second Prize, 20*l.*, for "Darnley," brown, 7 years-old; bred by the late Sir W. Stirling Maxwell, Bart., Keir, N.B.; sire, "Conqueror;" dam, "Peggie," by "Samson."

John Hendrie, Larbert, Stirling: Third Prize, 10*l.*, for "General Neil," brown, 4 years-old; bred by Mr. Arthur, Carlton Mains, Girvan, Ayr; sire, "Doncaster" (238); dam, "Nannie," by "Vanquisher" (890).

James Firth Crowther, Knowle Grove, Mirfield, Yorkshire: the *Reserve Number* to "Topsman," chestnut, 10 years-old; bred by Mr. George

† Given by the English Cart Horse Society, for the best two-year-old or yearling stallion.

‡ Given by the Clydesdale Horse Society for the best Stallion in the Clydesdale Classes.

Wilson, Whiteside, Alford, Aberdeenshire; sire, "Wonderful;" dam by "Samson."

Clydesdale Stallions—Three Years old.

JOHN M. MARTIN, Auchendrennan Farm, Balloch, N.B.: FIRST PRIZE, 50*l.*, for "The Abbot," brown; bred by the late Sir W. Stirling Maxwell, Bart., Keir, N.B.; sire, "Newstead" (559); dam, "Jess III.," by "Samson" (741).

JOHN WADDELL, Inch, Bathgate, Linlithgow: SECOND PRIZE, 20*l.*, for "Duke of Hamilton," brown; bred by Mr. Lawrence Drew, Merryton, N.B.; sire, "Prince of Wales;" dam, "Young Rosie," by "Young Sir Walter."

JAMES STEWART HODGSON, Lythe Hill, Haslemere, Surrey: THIRD PRIZE, 10*l.*, for "Clan Alpine," brown; bred by Mr. W. Ure, Bogton, Falkirk, N.B.; sire, "Merry Monarch" (538); dam, "Betty," by "Come Again."

ROBERT LODER, Whittlebury, Towcester, Northamptonshire: the *Reserve Number* to "Scotland Yet," bay; bred by Mr. Adam Gray, Ingleston, Kirkcudbright, N.B.; sire, "Young Sir Walter Scott" (1031); dam, "Kate," by "Galloway Tam."

Clydesdale Stallions—Two Years old.

ANDREW MONTGOMERY, Boreland, Castle Douglas, N.B.: FIRST PRIZE, 50*l.*, for "Prince Imperial," brown; bred by Mr. James Cunningham, Tarbreoch, Dalbeattie, N.B.; sire, "Dandy Jim" (221); dam, "Jean," by "Clansman" (150).

THE EARL OF STRATHMORE, Glamis Castle, Glamis, N.B.: SECOND PRIZE, 20*l.*, for "Chancellor," bay; bred by Mr. John Adam, Castletown, Glamis, N.B.; sire, "Thane of Glamis" (855); dam, "Jess," by "Defiance" (224).

DAVID RIDDELL, Blackhall, Paisley, N.B.: THIRD PRIZE, 10*l.*, for his brown; bred by Mr. James Smellie, Straven House, Carluke, Lanarkshire; sire, "Darnley;" dam, "Bell," by "Campsie."

THE EARL OF DUNMORE, Dunmore, Stirling, N.B.: the *Reserve Number* to "Blair Athole," bay; bred by Mr. Greig, Law, West Kilbride, N.B.; sire, "Lord Clyde" (482); dam by "Young Samson."

Clydesdale Stallions—One Year old.

DAVID RIDDELL, Blackhall, Paisley, N.B.: FIRST PRIZE, 20*l.*, for his brown; bred by the Marquis of Londonderry, Seaham Hall, Durham; sire, "What Care I;" dam, "Countess," by "The Champion."

ANDREW MONTGOMERY, Boreland, Castle Douglas, N.B.: SECOND PRIZE, 10*l.*, for his dark brown; bred by Mr. J. Dalziel, Tinwald Shaws, Dumfries, N.B.; sire, "Luck's All" (510); dam, by "General Williams" (326).

JOHN WADDELL, Inch, Bathgate, Linlithgow: THIRD PRIZE, 5*l.*

JAMES MCQUEEN, Crofts, Dalbeattie, N.B.: the *Reserve Number* to "Malcolm," bay; bred by himself; sire, "Robin the Laird" (25); dam, "Young Rosey," by "Hercules" (378).

Suffolk Stallions—Four Years old and upwards.

RICHARD GARRETT, Carleton Hall, Saxmundham, Suffolk: FIRST PRIZE, 50*l.*, for "Cupbearer III.," chestnut, 5 years-old; bred by Mr. C. Frost, Wher-

stead, Ipswich; sire, "Cupbearer II.;" dam, "Nonsuch," by "Sir Colin."

MANFRED BIDDELL, Playford, Ipswich, Suffolk: SECOND PRIZE, 20*l.*, for "Biddell's Ben," chestnut, 5 years-old; bred by Mr. Ashwell, Talkenham, Ipswich; sire, Biddell's "Captain Snap;" dam, "Doughty," by Laws's "Farmer:" THIRD PRIZE, 10*l.*, for "Dandy," chestnut, 4 years-old; bred by the late Mr. Heighham, Wetherden, Bury St. Edmunds; sire, Colonel Wilson's "Heir Apparent;" dam, "Ball," by "Goliath."

RICHARD GARRETT, Carleton Hall: the *Reserve Number* to "Crown Prince," chestnut, 6 years-old; bred by the late Mr. Blofield, Crown Farm, Leiston; sire, "Cupbearer;" dam, by Barker's "Goliath."

Suffolk Stallions—Three Years old.

SAMUEL WOLTON, Butley Abbey, Wickham Market, Suffolk: FIRST PRIZE, 50*l.*, for "Renown," chestnut; bred by himself; sire, "Monarch;" dam, "Dennington Matchet," by "Capon Boxer."

ALFRED JAMES SMITH, Red House, Rendlesham, Woodbridge, Suffolk: SECOND PRIZE, 20*l.*, for "Abbot Sampson," chestnut; bred by himself; sire, "Monarch;" dam, "Smart."

JOHN GROUT, Woodbridge, Suffolk: THIRD PRIZE, 10*l.*, for "Raglan," chestnut; bred by Mr. J. Smith, Thorpe Hall, Hasketon, Woodbridge; sire, "Cupbearer II.;" dam, by "Raglan."

WILLIAM BYFORD, The Court, Glemsford, Suffolk: the *Reserve Number* to "Reliance," chestnut; bred by Mr. Sturgeon, Ousden, Newmarket; sire, "Volunteer;" dam, "Violet," by "The Hero."

Suffolk Stallions—Two Years old.

MANFRED BIDDELL, Playford, Ipswich: FIRST PRIZE, 50*l.*, and the CHAMPION CUP,† value 25*l.*, for "Jingo," chestnut; bred by Mr. H. Biddell, Playford; sire, "Champion;" dam, "Red Violet," by H. Biddell's "Farmer:" SECOND PRIZE, 20*l.*, for "Rodney," chestnut; bred by Mr. Dack, Weston, Saxmundham; sire, "Cupearer III."

RICHARD GARRETT, Carleton Hall, Saxmundham, Suffolk: THIRD PRIZE, 10*l.* for "Zulu," chestnut; bred by himself; sire, "Cupbearer III.;" dam, "Sprite," by "Talbot."

WILLIAM WILSON, Baylham Hall, Ipswich: the *Reserve Number* to "Suffolk Star," chestnut; bred by Mr. W. Toller, Gedgrave, Orford, Suffolk; sire, "Prince Imperial;" dam, "Smart," by "Blight."

Suffolk Stallions—One Year old.

EARL HOWE, Gopsall Hall, Atherstone: FIRST PRIZE, 20*l.*, for "Old Boy," chestnut; bred by himself; sire, "Bradford;" dam, "Scot," by Walker's "Captain."

ROBERT E. LOFFT, Troston Hall, Bury St. Edmunds, Suffolk: SECOND PRIZE, 10*l.*, for "Jove," chestnut; bred by himself.; sire, "Young Cupbearer;" dam, "Maggie," by "Young Hero."

HORACE WOLTON, Newbourne Hall, Woodbridge, Suffolk: THIRD PRIZE, 5*l.*, for "The Oriental," chestnut; bred by himself; sire, "Royalty;" dam, "Newbourne Brag," by "Royal Duke II."

† Given by Lord Waveney, President of the Suffolk Stud Book Association, for the best Suffolk Stallion.

JOHN GROUT, Woodbridge, Suffolk: the *Reserve Number* to his chestnut; bred by Mr. G. W. Edwards, High Hall, Bredfield, Woodbridge; sire, "Young Emperor;" dam, by "Monarch."

Thoroughbred Stallions, suitable for getting Hunters.

H. F. CLARE VYNER, Newby Hall, Ripon, Yorkshire: FIRST PRIZE, 100*l.*, for "Duc de Beaufort," chestnut, 9 years-old; bred by Count Lagrange; sire, "Ventre St. Gris;" dam, "Dame d'Honneur," by "The Baron."

LORD TREDEGAR, Tredegar Park, Newport, Monmouthshire: SECOND PRIZE, 25*l.*, for "Make-Haste," chestnut, aged; bred by Lord Glasgow; sire, "Tom Bowline," dam, "Makeshift," by "Voltigeur."

JOHN GOODLIFFE, Huntingdon: THIRD PRIZE, 10*l.*, for "Caterer," bay, aged; bred by Mr. J. Johnstone; sire, "Stockwell;" dam, "Selina," by "Orlando."

PRINCE SOLTYKOFF: the *Reserve Number* to "Tassel," brown, 6 years-old; bred by Mr. Croft; sire, "The Drake;" dam, "Belladrum," by "Chanticleer."

Stallions suitable for getting Coach-Horses.

CHRISTOPHER W. WILSON, High Park, Kendal, Westmoreland: FIRST PRIZE, 50*l.*, for "Lord Penzance," bay, 5 years-old; bred by Mr. William Dale, Stamford Bridge, Yorks; sire, "Palestine;" dam, by "Grand Inquisitor."

WILLIAM BURTON, 55 High Street, Marylebone, London: SECOND PRIZE, 20*l.*, for his dappled brown, 4 years-old; bred by Mr. Thomas Fairman, Themelthorpe, Aylsham, Norfolk.

THE STAND STUD COMPANY, Whitefield, Manchester: THIRD PRIZE, 10*l.*, for "Lord Beaconsfield," bay, 3 years-old; bred by Mr. J. Kirby, Burton Fields, Stamford Bridge, Yorks; sire, "Roseberry;" dam, "Flora," by "The Earl."

GEORGE BURTON, Thorpe Willoughby, Selby, Yorkshire: the *Reserve Number* to "Zetland," bay, 6 years-old; bred by Mr. Laverack, Althorpe, Howden, York.

Stallions suitable for getting Hackneys.

THE STAND STUD COMPANY, Whitefield, Manchester: FIRST PRIZE, 30*l.*, for "Star of the East," chestnut, 7 years-old; bred by Mr. Cook, Thixendale, Yorkshire; sire, "Charley Merrylegs;" dam by "North Star."

JOHN BURTON BARROW, Ringwood Hall, Chesterfield, Derbyshire: SECOND PRIZE, 15*l.*, for "Young Perfection," dark brown, 5 years-old; bred by Mr. Utting, Little Melton, Norwich; sire, "Old Perfection;" dam, "Brunette," by "Don Carlos."

WILLIAM FLANDERS, Fen House, Mildenhall, Suffolk: THIRD PRIZE, 5*l.*, for "Reality," brown, 4 years-old; bred by himself; dam by "Tamworth."

HENRY ROUNDELL, Black Horse Hotel, Otley, Yorkshire: the *Reserve Number* to "Sir George Wombwell," brown, 7 years-old; bred by Mr. Joshua Yeadon, Fewston, Otley; sire, "Sir George;" dam by "Matchless Merrylegs" or "Grey Atlas."

Pony Stallions, above 13 hands 2 inches and not exceeding 14 hands 2 inches.

CHRISTOPHER W. WILSON, High Park, Kendal, Westmoreland: FIRST PRIZE, 25*l.*, for "The Nobleman," black, 5 years-old; bred by Mr. Youngman, Wyndham, Norfolk; sire, "Confidence."

TOM STEPHENSON, Barmston, Lowthorpe, Yorkshire: SECOND PRIZE, 15*l.*, for "Prince Charlie," brown, 5 years-old; bred by himself; sire, "Triffit's Fireaway;" dam, "Sally," by "Young Charlie."

THE STAND STUD COMPANY, Whitefield, Manchester: THIRD PRIZE, 5*l.*, for "Young Prickwillow," brown, 5 years-old; bred by Mr. Flanders, Fen House, Mildenhall; sire, "Confidence."

JOHN GROUT, Woodbridge, Suffolk: the *Reserve Number* to "Honesty," brown, 5 years-old; bred by Mr. Farrow, Kempston Hall, Norfolk; sire, "Confidence;" dam, by "Robin Hood."

Pony Stallions not exceeding 13 hands 2 inches.

CHRISTOPHER W. WILSON, High Park, Kendal: FIRST PRIZE, 15*l.*, for "Little Wonder," brown, 7 years-old; bred by Mr. Armes, Norwich; sire, "Confidence:" SECOND PRIZE, 10*l.*, for "George II.," bay, 5 years-old; bred by himself; sire, "Sir George;" dam, "Lady Mary:" and THIRD PRIZE, 5*l.*, for "Sir Garnet Wolseley," brown, 2 years-old; bred by Mr. H. Hunt, Preston; sire, "Sir George;" dam, by "Kettledrum."

ARTHUR JERVOISE SCOTT, Rotherfield Park, Alton, Hants: the *Reserve Number* to "Prince Charming," bay, 6 years-old; bred by himself; sire, "Perfection;" dam, "Cinderella."

Agricultural Mares and Foals.

EDWARD and ALFRED STANFORD, Eatons, Ashurst, Steyning: FIRST PRIZE, 30*l.*, for "Poppet," brown, 7 years-old (foal by "Young Topsman"); breeder unknown.

THE EARL OF ELLESMERE, Worsley Hall, Manchester: SECOND PRIZE, 20*l.*, for "Honest Lady," bay, 10 years-old (foal by "Samson"); bred by Mr. Flintham, Somersham; sire, Welcher's "Honest Tom:" THIRD PRIZE, 10*l.*, for "Beauty," black, 7 years-old (foal by Kite's "William the Conqueror"); bred by Mr. Potter, Lockington Grounds, Derby; sire, Barton's "Young Champion:" and the *Reserve Number* to "Flora," brown, 6 years-old (foal by "British Wonder"); bred by Mrs. Millhouse, Sketchley Hall, Hinckley; sire, "A 1."

Clydesdale Mares and Foals.

ANDREW MONTGOMERY, Boreland, Castle Douglas, N.B.: FIRST PRIZE, 30*l.*, for "Borness Bett," brown, 7 years-old; bred by Mr. Sproat, Borness, Kirkcudbright (foal by "Bonnie Scotland"); sire, "Loch Fergus Champion" (449); dam, by "Victor" (892).

ROBERT LODER, Whittlebury, Towcester, Northamptonshire: SECOND PRIZE, 20*l.*, for "Maggie," brown, 10 years-old (foal by "Chieftain"); breeder unknown; sire, "Loch Fergus Champion" (449); dam, "Inkermann," by "Lord Byron" (473).

JOHN M. MARTIN, Auchendennan Farm, Balloch, Dumbartonshire: THIRD PRIZE, 10*l.*, for "Ranee," brown, 7 years-old (foal by "Prince Charlie," 628); bred by Mr. H. Hardie, Bowmains; sire, "Black Prince" (52); dam, "Spark," by "Johnny Cope" (516).

JOHN WADDELL, Inch, Bathgate, Linlithgow: the *Reserve Number* to "Maggie," brown, 5 years-old (foal by "Prince Charlie"); bred by Mr. Finlay, Wellheads, Midcalder; sire, "Galloway Bob;" dam, "Doughty," by "Lord Clyde."

Suffolk Mares and Foals.

DANIEL ABBOTT GREEN, East Donyland, Colchester: FIRST PRIZE, 30*l.*, and the CHAMPION CUP,† value 25*l.*, for "Smart," chestnut, 9 years-old (foal by Cant's "Captain"); bred by himself; sire, "President;" dam, "Darby."

RICHARD GARRETT, Carleton Hall, Saxmundham, Suffolk: SECOND PRIZE, 20*l.*, for "Scot," chestnut, 10 years-old (foal by "Cupbearer the 3rd"); bred by the late Mr. T. Capon, Dennington, Wickham Market; sire, "Duke."

THE DUKE OF HAMILTON AND BRANDON, K.T., Easton Park, Wickham Market, Suffolk: THIRD PRIZE, 10*l.*, for "Bright Diamond," chestnut, 7 years-old (foal by "Tip-top"); bred by Mr. C. Frost, Wherstead, Ipswich; sire, "Monarch;" dam, "Diamond."

ROBERT E. LOFFT, Troston Hall, Bury St. Edmunds, Suffolk: the *Reserve Number* to "Duchess," chestnut, age unknown (foal by "Cock Robin"); bred by Mr. J. Harrison, Wordwell, Bury St. Edmunds.

Agricultural Fillies—Three Years old.

LAWRENCE DREW, Merryton, Hamilton, N.B.: FIRST PRIZE, 20*l.*, and the CHAMPION CUP,‡ value 25*l.*, for "Camilla," brown; breeder unknown.

JAMES CRONSHAW, Erskine Street, Hulme, Manchester: SECOND PRIZE, 10*l.*, for "Cyprus," bright bay; bred by himself; sire, "Honest Tom;" dam, "Dinah," by "Grey Confidence."

JOHN NIX, Outseats Stud Farm, Alfreton, Derbyshire: THIRD PRIZE, 5*l.*, for "Jewess," black, breeder unknown; sire, Winsby's "Sweep;" dam, by Dack's "Matchless."

THE EARL OF ELLESMERE, Worsley Hall, Manchester: the *Reserve Number* to his chestnut; bred by Mr. B. Brown, St. Ives; sire, Daintree's "Grand Prince."

Clydesdale Fillies—Three Years old.

JOHN M. MARTIN, Auchendennan Farm, Balloch, Dumbartonshire: FIRST PRIZE, 20*l.*, for "Effie Deans," bay; bred by Mr. J. Ralston, Milmaiw, Stranraer; sire, "Lord Lyons" (489); dam, "Jess," by "Victor" (892).

ROBERT MURDOCH, Hallside, Newton, Lanarkshire: SECOND PRIZE, 10*l.*, for "Adela," brown; bred by Mr. A. Baxter, Auchenheath, Lesmahagon; sire, "Warrior;" dam, "Nancy," by Mr. Robertson's "Diamond."

† Given by Lord Waveney, President of the Suffolk Stud Book Association, for the best Suffolk brood mare or filly.

‡ Given by the English Cart Horse Society for the best agricultural mare or filly (not Clydesdale or Suffolk), three years old or upwards.

ROBERT LODER, Whittlebury, Towcester, Northamptonshire: THIRD PRIZE, 5*l*., for "Young Sally II.," bay; bred by Mr. Chandos-Pole-Gell, Hopton Hall, Wirksworth; sire, "Loch Fergus Champion" (449); dam, "Sally," by "Keir Byron" (101).

JAMES CUNNINGHAM, of Tarbroch, Dalbeattie, N.B.: the *Reserve Number* to "Evelyn," bay; by Mr. Brock, Barns of Clyde; sire, "Time of Day;" dam, "Barns Maggie," by "Farmer."

Suffolk Fillies—Three Years old.

HERMAN BIDDELL, Playford, Ipswich, Suffolk: FIRST PRIZE, 20*l*., for "Bangle," chestnut; bred by himself; sire, "Champion;" dam, "Otley Pearl," by Wilson's "President."

WILLIAM BYFORD, The Court, Glemsford, Suffolk: SECOND PRIZE, 10*l*., for "Barmaid," chestnut; bred by himself; sire, "Active;" dam, "Pride."

RICHARD GARRETT, Carleton Hall, Saxmundham, Suffolk: THIRD PRIZE, 5*l*., for "Fancy," chestnut; bred by Mr. Foulsham, Middleton, Yoxford, Suffolk; sire, "Retaliator."

HORACE WOLTON, Newbourne Hall, Woodbridge, Suffolk: the *Reserve Number* to "Newbourne Damsel," chestnut; bred by himself; sire, "Royalty;" dam, "Newbourne Darling," by Cottingham's "Talbot."

Agricultural Fillies—Two Years old.

WILLIAM WELCHER, Griston Hall, Watton, Norfolk: FIRST PRIZE, 20*l*., and the CHAMPION CUP,† value 25*l*., for "Honest Lady," bay; bred by Mr. H. Cole, Flatt Bridge, Willingham, Cambs; sire, "King of the Fens."

JAMES FORSHAW, Blyth, Worksop, Notts: SECOND PRIZE, 10*l*., for "London Maggie," bright bay; bred by Mr. Gyles, Appleby Head, Worksop; sire, "William the Conqueror."

THE EARL OF ELLESMERE, Worsley Hall, Manchester: THIRD PRIZE, 5*l*., for his bay; bred by Mr. Marfit, King's Lynn; sire, Marster's "England's Wonder;" dam, by "World's Wonder:" and the *Reserve Number* to his chestnut; bred by Mr. Moyes, Cambridge; sire, "Samson;" dam, by Welcher's "Honest Tom."

Clydesdale Fillies—Two Years old.

H.R.H. THE PRINCE OF WALES, Sandringham, Norfolk: FIRST PRIZE, 20*l*., and the CHAMPION CUP,‡ value 25*l*., for his brown; bred by Mr. Lawrence Drew, Merryton, Hamilton; sire, "Prince of Wales;" dam, "Old Rosie," by "Loch Fergus Champion."

JOHN WADDELL, Inch, Bathgate, Linlithgow: SECOND PRIZE, 10*l*., for "Louisa," brown; bred by Mr. Murdoch, East Haughen, Uddington; sire, "Darnley;" dam, "Bell," by "Young Campsie."

JOHN M. MARTIN, Auchendennan Farm, Balloch, N.B.: THIRD PRIZE, 5*l*., for his bay; bred by Mr. P. Stroyan, Dundinnie, Leswale, Stranraer; sire, "Lord Lyon" (489); dam, by "Victor" (892).

---

† Given by the English Cart Horse Society for the best Two-year-old or Yearling Agricultural Filly (not Clydesdale or Suffolk).

‡ Given by the Clydesdale Horse Society for the best Brood Mare or Filly in the Clydesdale Classes.

ROBERT LODER, Whittlebury, Towcester: the *Reserve Number* to "Jeannie Sproat," bay; bred by Mr. J. Cunningham, Tarbroch, Dalbeattie; sire, "Dandy Jim" (221); dam, "Doll," by "Gladstone" (333).

Suffolk Fillies—Two Years Old.

SAMUEL TOLLER, Letheringham Lodge, Wickham Market, Suffolk: FIRST PRIZE, 20*l.*, for "Duchess," chestnut; bred by himself; sire, "Prince Imperial;" dam, "Scot," by "Cupbearer."

THE DUKE OF HAMILTON AND BRANDON, K.T., Easton Park, Wickham Market, Suffolk: SECOND PRIZE, 10*l.*, for "Yellow Diamond," chestnut; bred by himself; sire, "Cupbearer II.;" dam, "Bright Diamond," by "Monarch."

ALFRED JAMES SMITH, Red House, Rendlesham, Woodbridge: THIRD PRIZE, 5*l.*, for "May Queen," chestnut; bred by himself; sire "Prince Imperial;" dam, "Smart."

WILLIAM BYFORD, The Court, Glemsford, Suffolk: the *Reserve Number* to "Empress," chestnut; bred by himself; sire, "Active;" dam, "Smart," by "Emperor."

Yearling Agricultural Fillies.

JOHN ROWELL, Manor Farm, Bury Hunts: FIRST PRIZE, 15*l.*, for his bay-brown; bred by himself; sire, "Honest Tom;" dam, "Diamond," by "Samson."

THOMAS HORROCKS MILLER, Singleton Park, Poulton-le-Fylde, Lancashire: SECOND PRIZE, 10*l.*, for "Bessie," bay; bred by Mr. W. Shaw, Thornton, Poulton-le-Fylde; sire, "Honest Tom;" dam, "Flower," by "England's Glory."

LAWRENCE DREW, Merryton, Hamilton, N.B.: THIRD PRIZE, 5*l.*, for his brown; breeder unknown.

HENRY PULLEINE, Baxter Hall, Selby, Yorkshire: the *Reserve Number* to "Topsy," chestnut; bred by himself.

Yearling Clydesdale Fillies.

JOHN M. MARTIN, Auchendennan Farm, Balloch, Dumbartonshire: FIRST PRIZE, 15*l.*, for his dark bay; bred by Mr. J. Ross, Titwood, Dunlop, N.B.; sire, "Young Lord Lyon" (994); dam, by "Loch Fergus Champion" (449).

THOMAS MCQUEEN, Crofts, Dalbeattie, N.B.: SECOND PRIZE, 10*l.*, for "Kelpie," bay; bred by himself; sire, "Young Lord Lyon" (994); dam, "Darling," by "Lorne" (499).

LAWRENCE DREW, Merryton, Hamilton, N.B.: THIRD PRIZE, 5*l.*, for his brown; bred by Mr. D. Riddell, Blackhall, Paisley, N.B.; sire, "Pope;" dam, by "Young Lofty."

THE MARQUESS OF LONDONDERRY, Seaham Hall, Durham: the *Reserve Number* to his brown; bred by himself; sire, "What Care I;" dam, "Nance," by "Hendrie's Farmer."

Yearling Suffolk Fillies.

WILLIAM TOLLER, Gedgrave, Wickham Market, Suffolk: FIRST PRIZE, 15*l.*, for "Shelduck," chestnut; bred by himself; sire, "Standard Bearer;" dam, "Scoten."

William Byford, The Court, Glemsford, Suffolk: Second Prize, 10*l.*, for his chestnut; bred by himself; sire, "Volunteer;" dam, "Bragg," by "The Hero."

Robert E. Lofft, Troston, Bury St. Edmunds, Suffolk; Third Prize, 5*l.*, for "Jenny," dark chestnut; bred by himself; sire, "Young Cupbearer;" dam, "Brisk."

Hunter Mares and Foals.

George Leighton, Osgodby, Scarborough, Yorkshire: First Prize, 30*l.*, for "Snowflake," bay, aged (foal by "Landmark"); bred by Mr. Marris, Lincolnshire; sire, "Magnum;" dam, by "Professor Buck."

John Goodliff, George Hotel, Huntingdon: Second Prize, 20*l.*, for "Evangeline," bay, aged (foal by "Julius"); breeder unknown; dam, "Evangeline," by "Lambton" or "Magnum."

William Edward Oakeley, Cliff House, Atherstone: Third Prize, 10*l.*, for "Minerva," brown, about 12 years-old (foal by "Watchman"); breeder unknown.

Robert E. Lofft, Troston Hall, Bury St. Edmunds, Suffolk: the *Reserve Number* to "Battlement," bay, aged (foal by "Gideon"); breeder unknown; sire, "Knight of Kars;" dam, "Miss Betty."

Coaching Mares and Foals.

John Kirby, Burton Fields, Stamford Bridge, Yorkshire: First Prize, 20*l.*, for "Flora," rich bay, 8 years-old (foal by the "Sultan"); bred by Mr. Bilton, Mowthorp, Castle Howard, Yorks; sire, "The Earl;" dam, by "Aristocrat:" and, Second Prize, 10*l.*, for "Yorkshire Lady," rich bay, 9 years-old (foal by "Lord Beaconsfield"); bred by Mr. J. Fawcett, Belthorp Farm, Bishop Wilton, Yorks; sire, "Splendour;" dam, by "Guardsman."

Walter Shoolbred, 127, Piccadilly, London: Third Prize, 5*l.*, for "Lechlade," black brown, 14 years-old (foal by "Buxton"); breeder unknown.

Hackney Mares and Foals, above 14 *hands* 2 *inches and not exceeding* 15 *hands* 2 *inches.*

Thomas Horrocks Miller, Singleton Park, Poulton-le-Fylde, Lancashire: First Prize, 20*l.*, for "Bella," brown, aged (foal by "The Squire"); breeder unknown.

Charles Lancaster, Kilogram Grange, Bedale, Yorkshire: Second Prize, 10*l.*, for "Maid of All Work," brown, 10 years-old (foal by "Denmark"); bred by Mr. Thompson, Hurworth, Darlington; sire, "The Norfolk Cob;" dam, by "McOrville."

Aquila Kirby, Finckle Street, Market Weighton, Yorkshire: Third Prize, 5*l.*, for "Nelly," bay, 10 years-old (foal by "Star of the East"); bred by himself.

Edmund Waller, M.D., R.N., Bridge Street, Peterborough: the *Reserve Number* to "Kitty," brown, 12 years-old (foal by "Little Jim"); breeder unknown; sire, "Lyden;" dam by "Theon."

Pony Mares and Foals, above 13 *hands* 2 *inches and not exceeding* 14 *hands* 2 *inches.*

CHRISTOPHER W. WILSON, High Park, Kendal, Westmoreland: FIRST PRIZE, 15*l.*, for "Miss Constance," chestnut, about 7 years-old (foal by "Sir George"); breeder unknown.

GEORGE FREDERICK STATTER, Park House, Whitefield, Manchester: SECOND PRIZE, 10*l.*, for "Polly," brown, aged (foal by "Young Prickwillow"); breeder unknown.

CHRISTOPHER W. WILSON, High Park, Kendal: THIRD PRIZE, 5*l.*, for "Lady Polo," bay, 7 years-old (foal by "Sir George"); breeder unknown.

JAMES FIRTH CROWTHER, Knowle Grove, Mirfield, Yorkshire: the *Reserve Number* to "Fairy," bay, 7 years-old (foal by "Charley Merry Legs"); breeder unknown; sire, "Triffit's Fireaway;" dam by "Sir Charles."

Pairs of Agricultural Mares or Geldings.

CHARLES WILLIAM BRIERLEY, Drinkwater Park, Prestwich, Manchester: FIRST PRIZE, 30*l.*, for "Champion," 7 years-old, "Jack," 7 years-old, both bay; breeders unknown.

JOHN WADDELL, Inch, Bathgate, Linlithgowshire: SECOND PRIZE, 15*l.*, for "Sheba," chestnut, 8 years-old; breeder unknown; "Darling," brown, 7 years-old; breeder unknown.

MESSRS. WATNEY AND CO., Stag Brewery, Pimlico, London: the *Reserve Number* to "Sultan," 7 years-old, "Wager," 6 years old, both bay; breeders unknown.

Agricultural Geldings—Four Years old or upwards.

THE EARL OF ELLESMERE, Worsley Hall, Manchester: FIRST PRIZE, 20*l.*, for "Ploughboy," bay, 6 years-old; bred by Mr. J. Brown, Coldham Hall, Wisbech; sire, "Farmer's Friend;" dam by "Thumper."

MESSRS. CAFFERATA AND CO., Beacon Hill, Newark-on-Trent: SECOND PRIZE, 10*l.*, for "Short," black, 6 years-old; breeder unknown.

THE EARL OF ELLESMERE, Worsley Hall: THIRD PRIZE, 5*l.*, for "Sultan," black, 5 years old; bred by Mr. Faller, Ramsey; sire, Thacker's "Heart of Oak."

JOHN WADDELL, Inch, Bathgate, Linlithgow: the *Reserve Number* to "Lofty," brown, 7 years-old; bred by Mr. McWilliams, Stranraer, Ayr, N.B.; sire, "Clansman."

Agricultural Geldings—Three Years old.

WILLIAM ROWELL, Bank, Peterborough: FIRST PRIZE, 15*l.*, for "Prince," roan; bred by Mr. W. Bird, Foxley, Towcester, Northampton; sire, "Carlisle;" dam, "Jewell."

THOMAS HORROCKS MILLER, Singleton Park, Poulton-le-Fylde, Lancashire: SECOND PRIZE, 10*l.*, for "Thunder," bay, bred by himself; sire, "Honest Tom;" dam, "Topsey."

Agricultural Mares—Four Years old and upwards.

JOHN WADDELL, Inch, Bathgate, Linlithgow, N.B.: FIRST PRIZE, 20*l.*, for "Countess," brown, 6 years-old; bred by Mr. W. Hawsworth, Bartonfield, Derby; sire, "Lofty."

Charles Beart, Stow Bardolph, Downham Market, Norfolk: Second Prize, 10*l.*, for "Lioness," chestnut, 7 years-old; bred by Mr. W. B. Morris, Thorney, Cambs; sire, "Nonpareil."

The Earl of Ellesmere, Worsley Hall, Manchester: Third Prize, 5*l.*, for "Beauty," brown, 10 years-old; bred by Mr. R. Griffin, Borough Fen, Peterborough; sire, "Comet": and the *Reserve Number* to "Honest Princess," bay, 8 years-old; bred by Mr. Frohock, Willingham; sire, Welcher's "Honest Tom."

Hunter Mares or Geldings, Five Years old and upwards, up to 15 *stone.*

John Snowdon Forster, Lowick House, Beal, Northumberland: First Prize, 50*l.*, for "King John," brown gelding, 6 years-old; bred by Mr. J. Dawson, jun., Trithington Hall, Morpeth; sire, "Lucifer;" dam, "Countess," by "Will-o'-the-Wisp."

Cecil Henry Legard, Boynton, Bridlington, Yorkshire: Second Prize, 20*l.*, for "Blacklock," dark dappled bay gelding, 6 years-old; bred by Mr. J. Jackson, Routh, Beverley, Yorks; sire, "Torreador;" dam by "Robinson."

Fitz-Oldaker, Gerrard's Cross, Slough, Bucks: Third Prize, 10*l.*, for his bay gelding, aged; breeder unknown; sire, "Voltigeur;" dam by "British German."

Andrew John Brown, North Elmshall Hall, Pontefract, Yorks: the *Reserve Number* to "Gambler," chestnut gelding, 6 years-old; breeder unknown; sire, "Knave of Hearts;" dam by "Emperor."

Hunter Mares or Geldings, up to 12 *stone—Five Years old and upwards.*

Andrew John Brown, North Elmshall Hall, Pontefract: First Prize, 30*l.*, for "Cockney," bay gelding, 5 years-old; breeder unknown; sire, "Londoner;" dam by "Arthur."

Charles Rose, Brook Bank, Malton, Yorks: Second Prize, 15*l.*, for "His Majesty," bay gelding, 6 years-old; bred by Mr. J. Steward, Penrith, Cumberland; sire, "Lord Hastings."

Richard Phipps, Spencer Parade, Northampton: Third Prize, 10*l.*, for "Emperor," black gelding, 8 years-old; breeder unknown.

Charles Cooper Hayward, Southill, Biggleswade, Bedfordshire: the *Reserve Number* to "Ferryman," bay gelding; breeder unknown.

Hunter Geldings—Four Years old.

John Young, Kenley, Surrey: First Prize, 15*l.*, for "Yeoman," chestnut; bred by the late Sir George Cholmondley; sire, "Ploughboy;" dam, "Bellona," by "Angelus."

Andrew John Brown, North Elmshall Hall, Pontefract: Second Prize, 15*l.*, for "Katerfelto," bay; breeder unknown; sire, "Decorator."

Foord Preston Newton, Norton Cottage, Malton, Yorks: Third Prize, 10*l.*, for "Golden Plover," chestnut; bred by Mr. Barker, Cowton, Northallerton; sire, "East Coast."

THOMAS ROSE, Melton Magna, Wymondham, Norfolk: the *Reserve Number* to "Fox Cover," bay; bred by Mr. T. J. Robinson, Leckby, Assenby, Thirsk; sire, "Argyle;" dam, "Go-a-head."

Hunter Mares—Four Years old.

THOMAS HEATH FODEN, Givendale Grange, Borobridge, Yorks: FIRST PRIZE, 25*l.*, for "Princess," grey; bred by Mr. J. Snarry, Marramatt Farm, Sledmere; sire, "Morocco;" dam, by "Ravenshill."

GEORGE BLAND BATTAMS, Kilworthy, Tavistock, Devon: SECOND PRIZE, 15*l.*, for "Nancy Lee," brown; bred by Mr. Andrews, Totnes; sire, "Make Haste."

Hunter Geldings—Three Years old.

EDWARD JAMES DAVY, Gulholme, Owersby, Market Rasen, Lincolnshire: FIRST PRIZE, 20*l.*, for "Prime Minister," chestnut; bred by himself; sire, "Vulcan;" dam by "Magnum."

WILLIAM ANDERSON, Houghton, Carlisle, Cumberland: SECOND PRIZE, 10*l.*, for "The Mystery," chestnut; bred by Mr. W. H. Mulcahy, Ballynooran; sire, "Fenian;" dam, "Tipple Cider."

JOHN ROWELL, Manor Farm, Bury, Hunts: THIRD PRIZE, 5*l.*, for "Woodman," chestnut; bred by Mr. George Ekens, Warboys, Hunts; sire, "Lifeboat."

RICHARD GARRETT, Carleton Hall, Saxmundham, Suffolk: the *Reserve Number* to his bay; bred by himself; sire, "The Beadle;" dam, "The Nun."

Hunter Mares—Three Years old.

JAMES TOMLINSON, Lutton Marsh, Long Sutton, Lincolnshire: FIRST PRIZE, 20*l.*, for "Princess Margaret," bright bay; bred by himself; sire, "Egbert;" dam by "Sloughy."

Coaching Mares or Geldings—Three Years old.

JOHN KIRBY, Burton Fields, Stamford Bridge, Yorks: FIRST PRIZE, 20*l.*, for "Yorkshireman," bay gelding; bred by the late Mr. Cuss, Green Hammerton, Yorks; sire, "Sir Garnet."

Coaching Mares or Geldings above Three Years old, suitable for Omnibus Work.

INGLE F. THODAY, Willingham, St. Ives: FIRST PRIZE, 20*l.*,† for his chestnut gelding, 9 years-old; bred by Mr. W. Few, Wentworth, Ely.

THE LONDON GENERAL OMNIBUS COMPANY (LIMITED), 6 Finsbury Square, London: the *Reserve Number* to their bay mare, 5 years old; breeder unknown.

† Given by the London General Omnibus Company.

Hackney Mares or Geldings, above 14 *hands* 2 *inches and not exceeding* 15 *hands* 2 *inches, and up to not less than* 15 *stone.*

JOHN ROBINSON, Cleveland House, Hull: FIRST PRIZE, 20*l.*, for "Charles the 2nd," dark-chestnut gelding, 8 years-old; bred by Mr. Fewston, Watton, Driffield.

JOHN P. CROMPTON, Thornholm, Burton Agnes, Hull: SECOND PRIZE, 10*l.*, for "Discord," chestnut gelding, 4 years-old; bred by himself; sire, "Denmark;" dam by "St. Giles."

JAMES RITCHIE, the Limes, Church End, Finchley, Middlesex: THIRD PRIZE, 5*l.*, for "Lincoln," brown gelding, 5 years-old; bred by Mr. M. Harrison, Barton, Driffield; sire, "Lord Stanley."

SIR PRYSE PRYSE, Bart., Gogerddan, Bowstreet (viâ Shrewsbury, R. S. O.): the *Reserve Number* to "The Dean," bay gelding, 7 years-old; bred by Mr. Rees, Cilgellcarrol, Lampeter; sire, "Sailor Bach."

Hackney Mares or Geldings, above 14 *hands* 2 *inches and not exceeding* 15 *hands* 2 *inches, and up to not less than* 12 *stone.*

JOHN ROBINSON, Cleveland House, Coltman Street, Hull: FIRST PRIZE, 20*l.*, for "Lady Watton," brown mare, 5 years-old; bred by Mr. Sterriker, Walton, Driffield; sire, "Denmark;" dam by "Old Rattler."

CHRISTOPHER W. WILSON, High Park, Kendal, Westmoreland: SECOND PRIZE, 10*l.*, for "Sunbeam," bay gelding, 8 years-old; breeder unknown; sire, "Bay President."

THE STAND STUD COMPANY, Stand Hall, Whitefield, Manchester: THIRD PRIZE, 5*l.*, for "Silver Locks," chestnut gelding, 4 years-old; bred by Mr. Major, Sledmere, Yorkshire; sire, "Denmark."

HENRY VILLAR, New Court House, Charlton Kings, Cheltenham: the *Reserve Number* to "Yorkshire Lass," brown mare, 5 years-old; bred by Mr. H. Clay, Northallerton; sire, "Van-Galen;" dam, by "Augur."

Ladies' Hackney Mares or Geldings, not exceeding 15 *hands.*

Dr. EDMUND WALLER, R.N., Bridge Street, Peterborough: FIRST PRIZE, 20*l.*, for "Comet," grey mare, 5 years-old; bred by Mr. Ernest Simpkins, Ablington, Marlborough; sire, "Tympanum."

FRANCIS COOK MATTHEWS, Easterfield House, Driffield, Yorks: SECOND PRIZE, 10*l.*, for "Zephyr," brown mare, 4 years-old; bred by Mr. H. Moore, Hutton, Cranswick, Hull; sire, "Fireaway."

CHRISTOPHER SIMPSON, Hartendale House, Flambro', Hull: the *Reserve Number* to "Chance," dark brown mare, 6 years-old; bred by himself; sire, Triffit's "Fireaway;" dam by "Guicowar."

Hackney Mares or Geldings, above 13 *hands* 2 *inches and not exceeding* 14 *hands* 2 *inches.*

WILLIAM HENRY MAWDSLEY, Astley House, Sharples, Bolton, Lancashire: FIRST PRIZE, 15*l.*, for "Queen of the Fairies," bay mare, 7 years-old; bred by Mr. C. W. Wilson, High Park, Kendal, Westmoreland: sire, "Young Charlie."

FRANK HOLESWORTH, Shipton, Market Weighton, Yorks: SECOND PRIZE, 10*l.*, for "The Swell," dark chestnut gelding, 5 years-old; bred by Mr. J. Lee, Brounsey House, Harswell, Pocklington; sire, "King Charley," by "Prickwillow."

FRANCIS COOK MATTHEWS, Easterfield House, Driffield, Yorkshire: THIRD PRIZE, 5*l.*, for "Reciprocity," bay gelding, 5 years-old; bred by Mr. Robert Carr, Low Farm, Kilham, Yorks; sire, "Denmark."

GEORGE SAMUEL HALL, Ely, Cambs: the *Reserve Number* to "Beauty," dark bay mare, 6 years-old; breeder unknown.

Pony Mares or Geldings above 12 *hands* 2 *inches and not exceeding* 13 *hands* 2 *inches.*

WILLIAM HENRY MAWDSLEY, Astley House, Sharples, Bolton-le-Moors, Lancashire: FIRST PRIZE, 15*l.*, for "Fanny," bay mare, 5 years-old; breeder unknown.

WILLIAM FOSTER, Grove Villas, Pontefract, Yorks: SECOND PRIZE, 10*l.*, for "Novelty," brown gelding, 6 years-old; breeder unknown.

GEORGE CLARKE, Lutton Marsh, Long Sutton, Lincolnshire: THIRD PRIZE, 5*l.*, for "Jeannette," brown mare, 4 years-old; bred by himself; sire, "Burghly."

Pony Mares or Geldings, not exceeding 12 *hands* 2 *inches.*

WILLIAM HENRY MAWDSLEY, Astley House, Sharples, Bolton, Lancashire: FIRST PRIZE, 15*l.*, for "Tiny," bay mare, 6 years-old; breeder unknown; sire, "Sir George."

JAMES WATNEY, Jun., M.P., Thorney House, Palace Gate, London: SECOND PRIZE, 5*l.*, for "Prince," grey gelding, 6 years-old; bred by Mr. T. Baker, Lynton, Devon.

WILLIAM FORSTER, Grove Villas, Pontefract: THIRD PRIZE, 5*l.*, for "Toby," black gelding, 8 years-old; breeder unknown.

MULES.

Mules, above 15 *hands, suitable for Agricultural and Heavy Draught purposes.*

CHARLES LESLIE SUTHERLAND, Coombe, Croydon, Surrey: FIRST PRIZE, 20*l.*, for "Beauty," grey Poitou, 9 years-old: SECOND PRIZE, 10*l.*, for "Blossom," brown Poitou, 11 years-old: and THIRD PRIZE, 5*l.*, for "Brunette," brown Poitou, 9 years-old.

CHARLES MAXFIELD HODSOLL, Loose Court, Maidstone, Kent: the *Reserve Number* to his iron-grey, 5 years-old.

Mules, not exceeding 15 *hands, for general purposes.*

CHARLES LESLIE SUTHERLAND, of Coombe, Croydon, Surrey: FIRST PRIZE, 20*l.*, for "Centennial Harry," piebald, 8 years-old; bred in Kentucky.

JOSEPH CHARLES PARKINSON, Dock House, Newport, Monmouthshire: SECOND PRIZE, 10*l.*, for "Dena," brown, 4 years-old: bred by Sir George Elliot, Bart., M.P., Aberaman: sire, "Hassan" (Egyptian); dam, a Welsh pony.

THE DUKE OF BEAUFORT, K.G., Badminton, Chippenham, Wilts: THIRD PRIZE, 5*l.*, for "Blanche," bay, aged; breeder unknown.

THE AYLESBURY DAIRY COMPANY, 31, St. Petersburg Place, Bayswater, London: the *Reserve Number* to "Marie," bay Pyrenean or Spanish, 3 years-old; bred by M. Denis, Buzidelat.

ASSES.

Stallion Asses, three years old and upwards.

CHARLES LESLIE SUTHERLAND, Coombe, Croydon, Surrey: FIRST PRIZE, 20*l.*, for "Comte de Vitre," brown Poitou, 4 years-old.

LORD ARTHUR CECIL, Orchardmains, Innerleithen, N.B.: SECOND PRIZE, 10*l.*, for "David," black Poitou, 4 years-old; bred by Mr. C. L. Sutherland, Coombe, Croydon; sire, "Cormillon;" dam, "Comtesse."

SIR GEORGE ELIOT, Bart., M.P., of Aberaman House, Aberdare, Glamorganshire: the *Reserve Number* to "Hassan," white Egyptian, 8 years-old.

She Asses.

CHARLES LESLIE SUTHERLAND, Coombe, Croydon, Surrey: FIRST PRIZE, 20*l.*, for "Adele," brown Poitou, aged.

EDWARD PEASE, Greencroft, Darlington, Co. Durham: SECOND PRIZE, 10*l.*, for "Jenny," brown, 3 years-old; bred by Exhibitor; sire, "Leon," a Poitou; dam, a Maltese.

LORD ARTHUR CECIL, Orchardmains, Innerleithen, N.B.: the *Reserve Number* to "Jenny Lind," black, 3 years-old; bred by Mr. C. L. Sutherland, Coombe, Croydon; sire, "Comte de Poitou;" dam, "Prima Donna."

CATTLE.

Shorthorn Bulls above Three Years old.

LORD RATHDONNELL, Lisnavagh, Tullow, Co. Carlow: FIRST PRIZE, 50*l.*, for "Anchor" (32,947), roan, 5 years, 4 months, 1 week, 5 days-old; bred by Mr. Richard Chaloner, King's Fort, Moynalty, Co. Meath; sire, "King James" (28,971); dam, "Alma 2nd," by "Hohenlohe" (18,074); g. d., "Alma," by "Crusade" (7938); gr. g. d., "Georgia," by "The Stuart" (7623), gr. g. g. d., "Zuleika," by "Norfolk" (2377).

THOMAS WILLIS, Jun., Manor House, Carperby, Bedale, Yorkshire: SECOND PRIZE, 25*l.*, for "Rear-Admiral" (37,310); roan, 4 year, 3 weeks, 2 days-old; bred by himself; sire, "Admiral Windsor;" (32,912); dam, "Windsor's Hyacinth," by "Windsor's Prince" (32,164); g. d.,

"Camelia Windsor," by "Windsor Fitz-Windsor" (25,458); gr. g. d., "Camelia," by "Royal Alfred" (18,748); gr. g. g. d., "Mayflower," by "Knight of the Garter" (13,124).

THE EARL OF ELLESMERE, Worsley Hall, Manchester: THIRD PRIZE, 15*l.*, for "Attractive Lord" (32,968), red and white, 5 years, 1 month, 1 day-old; bred by Mr. T. Pears, Hackthorne, Lincoln; sire, "Knight of Killerby" (28,999); dam, "Attraction," by "Robin" (24,968); g. d., "Alice Buckingham," by "Royal Buckingham" (20,718); gr. g. d., "Anna Maria," by "Sir Roger" (16,991); gr. g. g. d., "Adelaide," by "The Squire" (12,217).

JOHN OUTHWAITE, Bainesse, Catterick, Yorkshire: FOURTH PRIZE, 10*l.*, for "Royal Windsor" (28,890), white, 10 years, 5 months, 3 weeks, 4 days-old; bred by Mr. T. Willis, Manor House, Carperby, Bedale; sire, "Windsor Fitz-Windsor" (25,458); dam, "Royal Lily," by "Fitz-Clarence" (14,552); g. d., "Water Lily," by "The Silkey Laddie" (10,947); gr. g. d., "Lily of the Nile," by "Wilberforce" (9830); gr. g. g. d., "Lily of the Valley," by "Hartforth" (9191).

WILLIAM LINTON, Sheriff Hutton, York: the *Reserve Number* to "Sir Arthur Ingram" (32,490), roan, 7 years, 5 months, 6 days-old; bred by himself; sire, "Sergeant-Major" (29,957); dam, "Fragrance," by "Mountain Chief" (20,383); g. d., "Miss Topsy," by "Blood Royal" (17,423); gr. g. d., "Yorkshire Lass," by "Magnus Troil" (14,880); gr. g. g. d., "Beauty," by "Bates" (12,451).

Shorthorn Bulls above Two and not exceeding Three Years old.

THOMAS WILLIS, Jun., Manor House, Carperby, Bedale, Yorkshire: FIRST PRIZE, 25*l.*, for "Vice-Admiral" (39,257), roan, 2 years, 10 months, 1 week, 5 days-old; bred by himself; sire, "Admiral Windsor" (32,912); dam, "Windsor's Hyacinth," by "Windsor's Prince" (32,164); g. d., "Camelia Windsor," by "Winsor Fitz-Windsor" (25,458); gr. g. d., "Camelia," by "Royal Alfred (18,748); gr. g. g. d., "Mayflower," by "Knight of the Garter" (13,124).

COLONEL R. NIGEL F. KINGSCOTE, C.B., M.P., Kingscote, Wotton-under-Edge, Gloucestershire: SECOND PRIZE, 10*l.*, for "Cowslip Boy" (38,051), roan, 2 years, 7 months, 1 week, 4 days-old; bred by himself; sire, "Duke of Hillhurst" (28,401); dam, "Cowslip 5th," by "Oxford Beau" (29,485); g. d., "Cowslip 3rd," by "Grand Duke 11th" (21,849); gr. g. d., "Cherry Cheeks," by "Mac Turk" (14,872); gr. g. g. d., "Cherry Lips," by "Cherry Duke 2nd" (14,265).

BRADBURY WILLIAM TASSELL, Hode, Patrixbourne, Canterbury: THIRD PRIZE, 10*l.*, for "Osman" (40,415), roan, 2 years, 5 months, 3 weeks, 5 days old; bred by Mr. R. Burn Blyth, Woolhampton, Reading; sire, "Alphonso" (32,943); dam, "Duchess Marie 2nd," by "Duke of Kennett" (30,977); g. d., "Valentine," by "Tam O'Shanter" (20,930); gr. g. d., "Rosa Bonheur," by "Prince Imperial" (16,740); gr. g. g. d., "Rosa," by "Marmaduke" (14,897).

ALEXANDER HENRY BROWNE, Callaly Castle, Alnwick, Northumberland: FOURTH PRIZE, 5*l.*, for "Patricio" (38,852), roan, 2 years, 6 months, 1 day-old: bred by himself; sire, "Pioneer" (35,042); dam, "Merry Princess," by "Merry Monarch" (22,349); g. d., "Princess," by "Abbotsford" (23,256); gr. g. d., "Wolviston Princess," by "Wolviston" (19,163); gr. g. g. d., "Ettrick Princess," by "Ettrick" (14,518).

James Slee Bult, Dodhill House, Kingston, Taunton: the *Reserve Number* to "Duke of Hazlecote 48th" (39,742), roan, 2 years, 3 months, 2 weeks, 3 days-old; bred by Colonel Kingscote, C.B., M.P., Kingscote Park, Wotton-under-Edge; sire, "Duke of Hillhurst" (28,401); dam, "Honey 24th," by "Second Duke of Wetherby" (21,618); g. d., "Honey 15th," by "Duke of Clarence" (19,611); gr. g. d., "Honeydew," by "Viceroy" (13,945); gr. g. g. d., "Helen," by "Oregon" (8371).

Shorthorn Yearling Bulls, above One and not exceeding Two Years old.

William Handley, Green Head, Milnthorpe, Westmoreland: First Prize, 25*l.*, for "Master Harbinger" (40,324), roan, 1 year, 7 months, 1 week, 6 days-old; bred by himself; sire, "Alfred the Great" (36,121); dam, "Earl's Flora," by "Earl of Eglinton" (23,832); g. d., "Flora Cobham," by "Marquis of Cobham" (22,299); gr. g. d., "Flower of Fitz-Clarence," by "Alfred Fitz-Clarence" (19,215); gr. g. g. d., "Miss Nicety," by "Veteran" (13,941).

The Rev. Robert Bruce Kennard, Marnhull, Blandford, Dorset: Second Prize, 15*l.*, for "Prince Regent," roan, 1 year, 5 months, 2 weeks, 3 days-old; bred by himself; sire, "Grand Duke of Oxford" (28,763); dam, "Queen Anne," by "Lord Stanley 2nd" (26,745); g. d., "Queen Bertha," by "Macaroni" (24,498); gr. g. d., "Mildred," by "Duke of Norfolk" (17,735); gr. g. g. d., "Moss Rose," by "Fanatic" (17,828).

William Linton, Sheriff Hutton, York: Third Prize, 10*l.*, for "Arthur Benedict," roan, 1 year, 4 months, 3 weeks, 4 days-old; bred by himself; sire, "Paul Potter" (38,854); dam, "Maleta," by "Sir Arthur Ingram" (32,490); g. d., "Maid of Honour," by "Sergeant-Major" (29,957); gr. g. d., "Hand Maid," by "May Day" (20,323); gr. g. g. d., "White Rose," by "Magnus Troil" (14,880).

Lord Arthur Cecil, Orchardmains, Innerleithen, Peeblesshire, N.B.: Fourth Prize, 5*l.*, for "Wild Oxonian" (40,927), roan, 1 year, 11 months, 3 weeks, 3 days-old; bred by Mr. Thomas Wilson, Shotley Hall, Northumberland; sire, "Duke of Oxford 31st" (33,713); dam, "Wild Eyebright," by "Sixth Duke of Geneva" (30,959); g. d., "Wild Eyes Duchess," by "Grand Duke 9th" (19,879); gr. g. d., "Wild Eyes 19th," by "Lablache" (16,353); gr. g. g. d., "Wild Eyes 18th," by "Solon" (13,766).

James Snarry, Maramatt Farm, Sledmere, York: the *Reserve Number* to "Lord of Ryedale" (40,214), roan, 1 year, 10 months, 3 weeks, 5 days-old; bred by himself; sire, "Oxford Ryedale 2nd" (34,991); dam, "Wild Rose," by "Ignoramus" (28,887); g. d., "Early Rose," by "Duke of Towneley" (21,615); gr. g. d., "Victoria Rose," by "Sir Roger" (16,991); gr. g. g. d., "Lady Victoria," by "Monk" (11,824).

Shorthorn Bull Calves, above Six and not exceeding Twelve Months old.

Joseph Stratton, Alton Priors, Marlborough, Wilts: First Prize, 20*l.*, for "Mercury," red, 11 months, 2 weeks, 4 days-old; bred by himself; sire, "Paragon" (37,176); dam, "Minerva," by "Eighth Duke of York" (23,808); g. d., "Europa," by "Windsor Castle" (21,118); gr. g. d., "Lilla," by "Hermit" (14,697); gr. g. g. d., "Eurydice 2nd," by "Lord of the Manor" (14,836).

Jabez Cruse, Cleave Farm, Bulkworthy, Brandiscorner, North Devon: Second Prize, 15*l.*, for "The Right Honourable Devonshire Dumpling," red and

white, 9 months, 1 week, 5 days-old; bred by himself; sire, "Oxford Duke 10th" (38,830); dam, "Charmer 2nd," by "Royal Windsor" (29,890); gr. d., "Charmer," by "Cistercian" (28,202); gr. g. d., "Charm," by "Bullion" (15,703); gr. g. g. d., "Cygnet," by "Captain" (14,229).

THOMAS WILSON, Shotley Hall, Northumberland: THIRD PRIZE, 10*l.*, for "Wild Freshman," roan, 11 months, 1 week, 2 days-old; bred by himself; sire, "Duke of Oxford 31st" (33,713); dam, "Wild Eyebright," by "Sixth Duke of Geneva" (30,959); g. d., "Wild Eyes Duchess," by "Grand Duke 9th" (19,879); gr. g. d., "Wild Eyes 19th," by "Lablache" (16,353); gr. g. g. d., "Wild Eyes 18th," by "Solon" (13,766).

JOHN AUBREY MUMFORD, Brill House, Thame, Oxfordshire: FOURTH PRIZE, 5*l.*, for "Country Boy," red, 10 months-old; bred by himself; sire, "Third Duke of Kirklevington" (33,684); dam, "Country Lass," by "Notley" (31,991); g. d., "Camilla," by "Earl of Lancaster" (21,647); gr. g. d., "Criterion," by "Earl Ducie" (17,767); gr. g. g. d., "Cricket," by "Sorcerer" (13,772).

JOHN THOMPSON, Badminton, Chippenham, Wilts: the *Reserve Number* to "Lord Darlington 18th," roan, 11 months, 1 week-old; bred by himself; sire, "Grand Duke of Gloucester" (36,721); dam, "Darlington 15th," by "Grand Duke of York" (24,071); g. d., "Darlington 10th," by "Fourth Duke of Oxford" (11,387); gr. g. d., "Darlington 1st," by "Thomas" (5471); gr. g. g. d., "Pretty Maid," by "Eryholme" (3736).

THE MARQUIS OF EXETER, Burghley Park, Stamford: the CHAMPION PRIZE,† value 100*l.*, for "Telemachus 6th."

Shorthorn Cows, above Three Years old.

TEASDALE HILTON HUTCHINSON, Manor House, Catterick, Yorkshire: FIRST PRIZE, 20*l.*, for "Grateful," roan, 4 years, 6 months, 5 days-old, in-milk and in-calf, calved March 4, 1879; bred by himself; sire, "M. C." (31,898); dam, "Gerty 3rd," by "Knight of the Shire" (26,552); g. d., "Gerty," by "Vain Hope" (23,102); gr. g. d., "Garland," by "Grand Master" (24,078); gr. g. g. d., "Bridget," by "Highthorn" (13,028).

THE MARQUIS OF EXETER, Burghley House, Stamford: SECOND PRIZE, 15*l.*, for "Telemacina," roan, 5 years, 7 months, 1 week, 3 days-old, in-calf; bred by himself; sire, "Telemachus" (27,603); dam, "Lady Penrhyn," by "Third Duke of Wharfdale" (21,619); g. d., "Nonpareil 21st," by "Duke of Geneva" (19,614); gr. g. d., "Nonpareil 20th," by "Marmaduke" (14,897); gr. g. g. d., "Nonpareil 19th," by "Matadore" (11,800).

JAMES SLEE BULT, Dodhill House, Kingston, Taunton: THIRD PRIZE, 10*l.*, for "Annette," white, 4 years, 2 weeks, 4 days-old, in-milk and in-calf, calved Sept. 20, 1878; bred by himself; sire, "Cardinal" (28,144); dam, "Anemone 9th," by "Grand Sultan" (26,311); g. d., "Anemone 7th," by "Augustus Windsor" (19,248); gr. g. d., "Anemone 3rd," by "Upstart" (9760); gr. g. g. d., "Anemone," by "Allan-a-Dale" (7778).

BENJAMIN ST. JOHN ACKERS, Prinknash Park, Painswick, Gloucestershire: FOURTH PRIZE, 5*l.*, for "Lady Carew 2nd," light roan, 3 years, 9 months, 1 week, 2 days-old, in-milk, calved March 14, 1879; bred by himself;

† Given by the Mansion House Committee for the best Shorthorn Male.

sire, "County Member" (28,263); dam, "Lady Jane," by "Baron Killerby" (23,364); g. d., "Miracle," by "Prince James" (20,554); gr. g. d., "Heather Bell," by "Hero" (18,055); gr. g. g. d., "Fanny," by "Rubens" (5027).

HER MAJESTY THE QUEEN, Windsor Castle: the *Reserve Number* to "Cawlina 5th," roan, 5 years, 1 month, 3 weeks-old, in-calf; bred by Her Majesty, Prince Consort's Shaw Farm, Windsor; sire, "King Tom" (31,521); dam, "Cawlina 2nd," by "Prince of Saxe-Coburg" (20,576); g. d., "Cawlina," by "Prince Alfred" (13,494); gr. g. d., "Cold Cream," by "Earl of Dublin" (10,178); gr. g. g. d., "Pansy," by "Gray Friar" (9172).

Shorthorn Heifers, in-milk or in-calf, above Two and not exceeding Three Years old.

FRANCIS J. SAVILE FOLJAMBE, M.P., Osberton Hall, Worksop, Notts: FIRST PRIZE, 20*l.*, for "Azucena," roan, 2 years, 10 months, 1 week, 6 days-old, in-calf; bred by himself; sire, "Sweet Pea" (35,708); dam, "Zingara," by "Knight of the Crescent" (26,547); g. d., "Zinganee," by "Knight of the Garter" (22,062); gr. g. d., "Gipsy Queen," by "Imperial Windsor" (18,086); gr. g. g. d., "Sybil," by "May Duke" (16,553).

THE DUKE OF RICHMOND AND GORDON, K.G., Gordon Castle, Fochabers, N.B.: SECOND PRIZE, 15*l.*, for "Chief Lustre," roan, 2 years, 7 months, 1 week-old, in-milk, calved March 26, 1879; bred by himself; sire, "Chief Officer" (36,359); dam, "Lustre 15th," by "Royal Hope" (32,392); g. d., "Lustre 12th," by "Baron Colling" (25,569); gr. g. d., "Lustre 10th," by "Michigan" (24,594); gr. g. g. d., "Lustre 5th," by "Prince Arthur" (16,723).

DAVID PUGH, Manoravon, Llandilo, Carmarthenshire: THIRD PRIZE, 10*l.*, for "Czarina 12th," roan, 2 years, 10 months, 4 weeks-old, in-calf; bred by himself; sire, "Duke of Albemarle" (28,355); dam, "Czarina 9th," by "Falconer" (23,907); g. d., "Czarina 5th," by "Earl of Elgin" (21,642); gr. g. d., "Zoe," by "Prince William" (20,607); gr. g. g. d., "Czarina 4th," by "Libra" (18,197).

ALBERT BRASSEY, Heythrop Park, Chipping Norton, Oxon: FOURTH PRIZE, 5*l.*, for "Jemima 4th," red and white, 2 years, 11 months, 4 weeks-old, in-calf; bred by himself; sire, "Parallax" (35,009); dam, "Jemima," by "Duke of Towneley" (21,615); g. d., "Jennet," by "Havelock" (14,676); gr. g. d., "Jenny Royal," by "Royal" (13,636); gr. g. g. d., "Jenny Lind," by "Fitzhardinge" (8073).

HER MAJESTY THE QUEEN, Windsor Castle: the *Reserve Number* to "Cawlina 9th," roan, 2 years, 7 months, 1 week, 6 days-old, in-milk and in-calf, calved February 20, 1879; bred by Her Majesty, Prince Consort's Shaw Farm, Windsor; sire, "Manrico" (26,805); dam, "Cawlina 5th," by "King Tom" (31,521); g. d., "Cawlina 2nd," by "Prince of Saxe Coburg" (20,576); gr. g. d. "Cawlina," by "Prince Alfred" (13,494); gr. g. g. d., "Cold Cream," by "Earl of Dublin" (10,178).

Shorthorn Yearling Heifers, above One and not exceeding Two Years old.

TEASDALE H. HUTCHINSON, Manor House, Catterick, Yorkshire: FIRST PRIZE, 20*l.*, and the CHAMPION PRIZE,† value 100*l.*, for "Gainful," roan, 1 year, 8 months, 1 week, 2 days-old; bred by himself; sire, "King Alfonso"

† Given by the Mansion House Committee for the best Shorthorn Female.

(36,832); dam, "Grateful," by "M. C." (31,898); g. d., "Gerty 3rd," by "Knight of the Shire" (26,552); gr. g. d., "Gerty," by "Vain Hope" (23,102); gr. g. g. d., "Garland," by "Grand Master" (24,078).

LORD FITZHARDINGE, Berkeley Castle, Gloucestershire: SECOND PRIZE, 15*l.*, for "Kirklevington Empress 3rd," roan, 1 year, 10 months, 1 week, 6 days-old; bred by himself; sire, "Duke of Connaught" (33,604); dam, "Kirklevington Empress," by "Second Duke of Tregunter" (26,022); g. d., "Siddington 7th," by "Seventh Duke of York" (17,754); gr. g. d., "Siddington 3rd," by "Seventh Duke of York" (17,754); gr. g. g. d., "Kirklevington 7th," by "Earl of Derby" (10,177).

WILLIAM HOSKEN AND SON, Loggan's Mill, Hayle, Cornwall: THIRD PRIZE, 10*l.*, for "Rose of Oxford 3rd," roan, 1 year, 11 months, 3 weeks-old; bred by themselves; sire, "Second Baron Wild Eyes" (30,497); dam, "Rose of Oxford," by "Fifth Earl of Oxford" (28,515); g. d., "White Rose," by "Thorndale Mason" (23,067); gr. g. d., "Moss Rose," by "Prince Frederick" (16,734); gr. g. g. d., "Fancy 2nd," by "Sir John Barleycorn" (12,085).

DAVID PUGH, Manoravon, Llandilo, Carmarthenshire: FOURTH PRIZE, 5*l.*, for "Tulip 4th," roan, 1 year, 4 months, 5 days-old; bred by himself; sire, "Falmouth" (38,268); dam, "Tulip," by "Prince of the Empire" (20,578); g. d., "Topsy," by "Britain" (17,463); gr. g. d., "Tabby," by "Puritan" (20,614); gr. g. g. d., "Topsy 2nd," by "General" (16,100): and the *Reserve Number* to "Marchioness Manoravon 4th," white, 1 year, 8 months, 1 week-old; bred by himself; sire, "Falmouth" (38,268); dam, "Marchioness Manoravon 1st," by "Lord Abbot" (29,052); g. d., "Marchioness," by "Lord Lyons" (26,677); gr. g. d., "Mistress Mary," by "Baron Warlaby" (7813); gr. g. g. d., "Water Witch," by "Royal Buck" (10,750).

Shorthorn Heifer Calves, above Six and not exceeding Twelve Months old.

LORD FITZHARDINGE, Berkeley Castle, Gloucestershire: FIRST PRIZE, 20*l.*, for "Lady Wild Eyes 15th," red and white, 10 months, 1 week-old; bred by himself; sire, "Duke of Connaught" (33,604); dam, "Lady Wild Eyes 6th," by "Second Duke of Tregunter" (26,022); g. d., "Lady Wild Eyes 3rd," by "Cherry Grand Duke" (23,554); gr. g. d., "Lady Wild Eyes 2nd," by "Touchstone" (20,986); gr. g. g. d., "Lady Wild Eyes," by "Weathercock" (9815).

MRS. SARAH JANE PERY, Coolcronan House, Ballina, Co. Mayo: SECOND PRIZE, 15*l.*, for "Madeline Benedicta," roan, 10 months, 3 weeks, 5 days-old; bred by herself; sire, "Royal Benedict" (27,348); dam, "Blythe Butterfly," by "Lord Blythe" (22,126); g. d., "Alice Butterfly," by "Master Butterfly" (13,311); gr. g. d., "Alice 2nd," by "Duke of Athol" (10,150); gr. g. g. d., "Madeline," by "Marcus" (2262).

SIR JOHN HENRY GREVILLE SMYTH, Bart., Ashton Court, Bristol: THIRD PRIZE, 10*l.*, for "Lady Ashton 4th," red and little white, 9 months, 2 weeks, 4 days-old; bred by himself; sire, "Duke of Connaught" (33,604); dam, "Lady Ashton 2nd," by "Earl of Leicester 3rd" (33,804); g. d., "Lady Penrhyn," by "Oxford Duke" (27,019); gr. g. d., "Nosegay," by "Earl of Darlington" (21,636); gr. g. g. d., "Nora," by "Stanley" (18,916).

WILLIAM HERBERT WODEHOUSE, Woolmers Park, Hertford: FOURTH PRIZE, 5*l.*, for "Countess of Woolmers 2nd," roan, 8 months, 2 weeks, 2 days-old;

bred by himself; sire, "Royal Havering 2nd" (35,375); dam, "Countess of Woolmers," by "Woolmers Duke" (32,890); g. d., "Countess," by "Archdale" (21,183); gr. g. d., "Lily," by "Duke of Argyle" (11,375); gr. g. g. d., "Cora," by "Marquis" (11,786).

WILLIAM HOSKEN AND SON, Loggan's Mill, Hayle, Cornwall: the *Reserve Number* to "Rose of Oxford 4th," roan, 11 months, 1 week, 4 days-old; bred by themselves; sire, "Duke of Oxford 33rd" (36,528); dam, "Rose of Oxford," by "Fifth Earl of Oxford" (28,515); g. d., "White Rose," by "Thorndale Mason" (23,067); gr. g. d., "Moss Rose," by "Prince Frederick" (16,734); gr. g. g. d., "Fancy 2nd," by "Sir John Barleycorn" (12,085).

Shorthorn Cows, and each with not less than Two of her Offspring.

THE MARQUIS OF EXETER, Burghley Park, Stamford: FIRST PRIZE, 50*l*., for "Sea Gull," roan, 11 years, 2 months, 2 weeks, 2 days-old; bred by himself; sire, "Nestor" (24,648); dam, "Petrel," by "Fourth Duke of Thorndale" (17,750); g. d., "Sandpiper," by "The Briar" (15,376); gr. g. d., "Water Wagtail," by "Francisco" (12,893); gr. g. g. d., "Water Rail," by "Columbus" (10,063). And *Offspring*, bred by himself: "Telemachus 6th" (35,725), roan bull, 6 years, 6 months, 2 weeks, 2 days-old; sire, "Telemachus" (27,603): "Telemachus 9th" (35,727), roan bull, 5 years, 6 months, 3 weeks, 6 days-old; sire, "Telemachus" (27,603): "Sea Bird," roan cow, 3 years, 1 month, 1 week, 3 days-old; sire, "Telemachus" (27,603): "Sea Lark," roan cow, 2 years, 3 months, 5 days-old; sire, "Telemachus" (27,603).

COLONEL R. LOYD LINDSAY, V.C., M.P., Lockinge Park, Wantage, Berks: SECOND PRIZE, 25*l*., for "Princess Rose," roan, 9 years, 11 months, 1 day-old; sire, "Duke of Jamaica" (23,758); dam, "Roan Duchess," by "Gloucester's Grand Duke" (12,949); g. d., "Charmer," by "Fourth Duke of York" (10,167); gr. g. d., "Chaplet," by "Usurer" (9763); gr. g. g. d., "Chaff," by "Duke of Cornwall" (5947). And *Offspring*, "Churchill," roan bull, 2 years, 7 months, 2 weeks, 1 day-old; sire, "Lord Rockville" (34,658): "Stamboul," roan bull, 1 year, 8 months, 2 weeks, 1 day-old; sire, "Lord Rockville" (34,658): "Red Prince," roan bull, 8 months, 1 week, 6 days-old; sire, "Earl of Horton 11th" (36,588); all bred by himself: and THIRD PRIZE, 10*l*., for "Buriesque," red, 10 years, 6 months, 3 weeks, 4 days-old; bred by the Earl of Radnor, Coleshill, Highworth; sire, "Fawsley Baronet" (23,920); dam, "Britannia," by "Master Coleshill" (18,344); g. d., "Blossom," by "Sultan" (15,358); gr. g. d., "Bloom," by "Neptune" (11,847); gr. g. g. d., "Rocket," by "Fanatic" (8054). And *Offspring*, bred by himself: "Blueberry," red cow, 8 years, 3 months, 3 weeks, 3 days-old; sire, "Rob Roy" (29,806): "Bella Donna," red cow, 7 years, 5 months, 1 week-old; sire, "Lord Napier" (26,691): "Bridesmaid," red cow, 6 years, 5 months, 4 weeks, 1 day-old; sire, "Lord Napier" (26,691): "Cherry Blossom," red cow, 3 years, 6 months, 3 weeks, 3 days-old; sire, "Duke of Cerisia" (30,937): "Barbara," cow, red, 8 months, 1 week, 1 day-old; sire, "Earl of Horton 11th" (36,588).

Hereford Bulls, above Three Years old.

AARON ROGERS, The Rodd, Kington, Herefordshire: FIRST PRIZE, 30*l*., and the CHAMPION PRIZE, value 50*l*., for "Grateful," 6 years, 1 week, 1 day-old; bred by himself; sire, "Sir Thomas" (2228); dam, "Lady Lizzie," by "Jupiter" (3191); g. d., "Lady Court Lass," by "David" (1204); gr. g. d., "Lady Court," by "Mameluke" (1307).

WILLIAM TAYLOR, Showle Court, Ledbury, Herefordshire: SECOND PRIZE, 20*l.*, for "Thoughtful" (5063), 4 years, 9 months, 6 days-old; bred by himself; sire, "Mercury" (3967); dam, "Young Beauty," by "Sir Francis" (3438); g. d., "Beauty," by "Holmer" (2043); gr. g. d., "Hazel," by "Tomboy" (1097).

JOHN ELLIOTT BEST, Tremeer, Lanteglos, Fowey, Cornwall: THIRD PRIZE, 10*l.*, for "Bedford," 5 years, 9 months, 5 days-old; bred by Mr. T. Fenn, Ludlow; sire, "Sir John 2nd" (3455); dam, "Duchess Bedford 6th," by "Severus 2nd" (2747); g. d., "Duchess Bedford," by "Arthur Napoleon" (910).

JOHN H. B. LUTLEY, Brockhampton, Worcester: the *Reserve Number* to "Cupid" (5284), 5 years, 2 months, 6 days-old; bred by himself; sire, "Byron 5th" (4393); dam, "Venus 2nd," by "Gardener" (5334); g. d., "Venus"; gr. g. d. "Petrel 3rd," by "Sir Richard" (1734).

Hereford Bulls, above Two and not exceeding Three Years old.

THOMAS JAMES CARWARDINE, Stockton Bury, Leominster, Herefordshire: FIRST PRIZE, 25*l.*, for "Anxiety," 2 years, 9 months-old; bred by himself; sire, "Longhorns" (4711); dam, "Helena," by "De Cote" (3060); g. d., "Regina," by "Heart of Oak" (2035); gr. g. d., "Lily," by "Titterstone."

THOMAS MYDDLETON, Llynaven, Clun, Shropshire: SECOND PRIZE, 15*l.*, for "Hartington" (5358), 2 years, 11 months, 2 weeks, 5 days-old; bred by Mr. Rogers, The Grove, Pembridge; sire, "Grove 3rd" (5051); dam, "Gay," by "Longhorn" (3216); g. d., "Gay," by "Matchless" (2110); gr. g. d., "Gay," by "Trusty" (2847).

THOMAS THOMAS, St. Hilary, Cowbridge, Glamorganshire: THIRD PRIZE, 5*l.*, for "Goldfinder," 2 years, 10 months, 1 week, 5 days-old; bred by himself; sire, "Horace 2nd" (4655); dam, "Rosaline," by "Sir John 3rd" (3456); g. d., "Fairy," by "Shamrock" (2750); gr. g. d., "Fairmaid 2nd" by "Goldfinder 2nd" (959).

Hereford Yearling Bulls, above One and not exceeding Two Years old.

JOHN HUNGERFORD ARKWRIGHT, Hampton Court, Leominster, Herefordshire: FIRST PRIZE, 25*l.*, for "Conjuror," 1 year, 10 months, 3 weeks, 5 days-old; bred by himself; sire, "Concord" (4458); dam, "Ivington Lass 3rd," by "Bayleaf" (3675); g. d., "Ivington Lass," by "Dan O'Connell" (1952).

REES WILLIAMS BRIDGWATER, Great Porthamal, Talgarth, Breconshire: SECOND PRIZE, 15*l.*, for "Romulus," 1 year, 8 months, 3 weeks, 1 day-old; bred by himself; sire, "Glendower 2nd" (3840); dam, "Harvest Queen," by "Orleans" (2661).

EDWARD LISTER, Cefn Ila, Usk, Monmouthshire: THIRD PRIZE, 5*l.*, for "Taurus," 1 year, 6 months, 2 weeks, 2 days-old; bred by himself; sire, "May Duke;" dam, "Vesta," by "Chanter" (3738); g. d., "Leda," by "Chorister" (3021); gr. g. d., "Young Venus," by "Earl Derby 2nd" (2510).

WILLIAM TAYLOR, Showle Court, Ledbury, Herefordshire: the *Reserve Number* to "Telephone," 1 year, 11 months, 3 weeks, 6 days-old; bred by himself; sire, "Tredegar" (5077); dam, "Snowdrop," by "The Wolverhampton Boy" (4198); g. d., "Snowdrop," by "Tambarine" (2254); gr. g. d., "Sparky."

Hereford Bull Calves, above Six and not exceeding Twelve Months old.

SARAH EDWARDS, Wintercott, Leominster, Herefordshire: FIRST PRIZE, 15*l.*, for "Coomasie," 11 months, 6 days-old; bred by herself; sire, "Royalist" (4921); dam, "Young Mermaid 4th," by "Winter de Cote" (4253); g. d., "Young Mermaid 2nd," by "Tomboy" (3526); gr. g. d., "Young Mermaid," by "Adforton" (1839).

THOMAS FENN, Stonebrooke House, Ludlow: SECOND PRIZE, 10*l.*, for "Downton Boy," 11 months, 3 weeks, 1 day-old; bred by himself; sire, "Grateful" (4622); dam, "Fairmaid," by "Faulty" (3098); g. d., by "Trump" (2842); gr. g. d., by "Prince" (524).

THOMAS MYDDLETON, Llynaven, Clun, Salop: THIRD PRIZE, 5*l.*, for "Victor," 11 months, 1 week, 6 days-old; bred by himself; sire, "Hartington" (5358); dam, "Nina," by "Sultan" (4163); g. d., "Miss Nobble'em," by "Nobleman" (2652); gr. g. d., by "Jerry" (976).

THOMAS JAMES CARWARDINE, Stockton Bury, Leominster, Herefordshire: the *Reserve Number* to "Overseer," 11 months, 3 days-old; bred by himself; sire, "Rodney" (4907); dam, "Flora," by "Sir Frank" (2762); g. d., "Florence," by "De Cote" (3060).

Hereford Cows above Three Years old.

SARAH EDWARDS, Wintercott, Leominster, Herefordshire: FIRST PRIZE, 20*l.*, and the CHAMPION PRIZE, value 50*l.*, for "Leonora," 3 years, 10 months, 2 weeks, 6 days-old, in-calf; bred by herself; sire, "Winter de Cote" (4253); dam, "Lovely," by "Tomboy" (3546); g. d. "Lady Grove," by "Adforton" (1839); gr. g. d., "Young Lively," by "Ben" (1870).

THE MISSES EVANS, Llandowlas, Usk, Monmouthshire: SECOND PRIZE, 10*l.*, for "Lady Blanche," 5 years, 4 months, 3 weeks-old, in-milk and in-calf, calved in Februrary, 1879; bred by the late Mr. Warren Evans, Llandowlas; sire, "Von Moltke 2nd" (4234); dam, "Fairmaid," by "Prince Alfred" (3342); g. d., "Countess 3rd," by "Monaughty" (2117); gr. g. d., "Countess 2rd," by "Oakley" (1673).

JOHN H. B. LUTLEY, Brockhampton, Worcester: THIRD PRIZE, 5*l.*, for "Teacher 2nd," 3 years, 11 months, 3 weeks, 3 days-old, in-milk, calved Sept. 1, 1878; bred by himself; sire, "Coriolanus" (3769); dam, "Governess," by "Shamrock 2nd" (2210).

WILLIAM BURCHALL PEREN, Compton House, South Petherton, Somersetshire: the *Reserve Number* to "Queen of the Roses," 4 years, 7 months, 4 weeks-old, in-calf; bred by himself; sire, "Lord Lincoln" (3320); dam, "Ivington Rose," by "Sir Thomas" (2228); g. d., "Red Rose," by "Master Butterfly" (1313); gr. g. d., "Moss Rose," by "Uncle Tom" (1108).

Hereford Heifers, in-milk or in-calf, above Two and not exceeding Three Years old.

WILLIAM TAYLOR, Showle Court, Ledbury, Herefordshire: FIRST PRIZE, 15*l.*, for "Lancashire Lass," 2 years, 10 months-old, in-calf; bred by himself sire, "Tredegar" (5077); dam, "Lovely," by "Tenant Farmer" (2806); g. d., "Browny," by "Twin" (2284).

SARAH EDWARDS, Wintercott, Leominster, Herefordshire: SECOND PRIZE, 10*l.*, for "Spangle 3rd," 2 years, 11 months, 2 weeks, 3 days-old, in-milk, calved Feb. 26, 1879; bred by herself; sire, "Royalist" (4921); dam, "Sonnet," by "Leominster 3rd" (3211); g. d. "Silk," by "Comet" (2469); gr. g. d., "Silva," by "Adforton" (1839).

JOHN WILLIAMS, Llansannor Court, Cowbridge, Glamorganshire: THIRD PRIZE, 5*l.*, for "Duchess," 2 years, 6 months, 2 weeks, 1 day-old, in-calf; bred by Mr. W. Tudge, of Adforton, Leintwardine, Herefordshire; sire, "The Doctor;" dam, "Juanita," by "Sir Roger" (4133); g. d., "Maid of Orleans," by "Orleans" (2661); gr. g. d., "Darling," by "Carbonel" (1525).

JOHN MORRIS, Lulham Court, Madley, Herefordshire: the *Reserve Number* to "Tidy 3rd," 2 years, 3 months, 4 weeks, 1 day-old, in-calf; bred by himself; sire, "Columbus" (4447); dam, "Tidy 2nd," by "Banquo" (3667); g. d., "Tidy," by "Zouavite" (2364).

Hereford Yearling Heifers, above One and not exceeding Two Years old.

JOHN HUNGERFORD ARKWRIGHT, Hampton Court, Leominster, Herefordshire: FIRST PRIZE, 15*l.*, for "Abigail," 1 year, 10 months, 3 weeks, 3 days-old; bred by himself; sire, "Ivington Boy" (4662); dam, "Miss Abigail 2nd," by "Sir Oliver 2nd" (1733); g. d., "Miss Abigail." And SECOND PRIZE, 10*l.*, for "Gaylass 4th," 1 year, 10 months, 3 weeks, 6 days-old; bred by himself; sire, "Ivington Boy" (4662); dam, "Gaylass 2nd," by "Sir Hungerford" (3447); g. d., "Gaylass," by "Riff Raff" (1052); gr. g. d., "Gaily," by "Young Quicksilver."

THOMAS THOMAS, St. Hilary, Cowbridge, Glamorganshire: THIRD PRIZE, 5*l.*, for "Lady 3rd," 1 year, 10 months-old; bred by himself; sire, "Horace 2nd" (4655); dam, "Lady 2nd," by "Sir John 3rd" (3456); g. d., "Lady," by "Goldfinder 2nd" (959); gr. g. d., "Comely," by "Young Royal" (1469).

FREDERICK PLATT, Upper Breinton, Hereford: the *Reserve Number* to "Bannerett 2nd," 1 year, 11 months, 2 weeks, 3 days old; bred by Mr. T. W. Tudge, Adforton, Leintwardine, Hereford; sire, "Maréchal Niel" (4760); dam, "Banneret," by "Sir Roger" (4133); g. d., "Bonnie," by "Carbonel" (1525); gr. g. d., "Beauty 2nd," by "Young Walford" (1820).

Hereford Heifer Calves, above One and not exceeding Twelve Months old.

JOHN HUNGERFORD ARKWRIGHT, Hampton Court, Leominster: FIRST PRIZE, 15*l.*, for "Antoinette," 11 months, 2 days-old; bred by himself; sire, "Ivington Boy" (4662); dam, "Miss Abigail 2nd," by "Sir Oliver 2nd" (1733); g. d., "Miss Abigail."

THOMAS LEWIS, The Woodhouse, Shobden, Herefordshire: SECOND PRIZE, 10*l.*, for "Jessie," 11 months, 4 weeks-old; bred by himself; sire, "Young Sir Frank" (4274); dam, "Tidy," by "Leominster" (3910); g. d., "Tidy 2nd," by "Orlton" (3293); gr. g. d., "Tidy 1st," by "Magnum Bonum" (2097).

FREDERICK PLATT, Upper Breinton, Hereford: THIRD PRIZE, 5*l.*, for "Lady 3rd," 9 months, 3 weeks, 4 days-old; bred by himself; sire, "Horace" (3877); dam, "Lady 2nd," by "Cholstrey" (1918); g. d., "Lady," by "Lord Clyde" (2084).

THOMAS THOMAS, St. Hilary, Cowbridge, Glamorganshire: the *Reserve Number* to "Tulip," 10 months, 3 weeks-old; bred by himself; sire, "Horace 2nd" (4655); dam, "Dahlia," by "Chieftain 2nd" (1917); g. d., "Silver," by "Alma;" gr. g. d., "Lady Byron," by "Berrington."

Hereford Cows, and each with not less than Two of her Offspring.

THOMAS JAMES CARWARDINE, Stockton Bury, Leominster, Herefordshire: FIRST PRIZE, 30*l*., for "Cherry," 6 years, 11 months, 3 weeks, 2 days-old, in-calf; sire, "De Cote" (3060); dam, "Lilac," by "Heart of Oak" (2035); g. d., "Tulip," by "Counsellor" (1939). And *Offspring*, cow, "Plum," 2 years, 2 months, 4 weeks-old; sire, "Longhorns" (4711); cow, "Apple Blossom," 1 year, 3 months, 4 weeks, 1 day-old; sire, "De Cote" (3060); all bred by himself.

THE EARL OF COVENTRY, Croome Court, Severn Stoke, Worcester: SECOND PRIZE, 15*l*., for "Giantess," 6 years, 11 months, 3 weeks, 4 days-old, in-calf; bred by Mr. Tudge, of Adforton, Leintwardine, Herefordshire; sire, "Sir Roger" (4133); dam, "Haidee," by "Battenhall" (2406); g. d., "Diana," by "Carbonel" (1525); gr. g. d., "Young Dainty," by "The Doctor" (1083). And *Offspring*, cow, "Britannia," 3 years, 6 months, 2 days-old; bred by Mr. Tudge; sire, "Doctor" (5045); cow, "Golden Treasure," 1 year, 1 month, 1 week, 2 days-old; bred by himself; sire, "Maréchal Niel" (4760).

WILLIAM TAYLOR, Showle Court, Ledbury, Herefordshire: THIRD PRIZE, 10*l*., for "Hazel," 14 years, 10 months-old; sire, "Tom Brown" (2828); dam, "Hazel," by "Holmer" (2043); g. d., "Hazel," by "Showle" (1384). And *Offspring*, bull, "Tredegar 4th," 1 year, 11 months, 2 weeks, 1 day-old; sire, "Tredegar" (5077); bull, "The Zulu," 8 months, 3 weeks-old; sire, "Thoughtful" (5063); all bred by himself.

Devon Bulls, above Three Years old.

VISCOUNT FALMOUTH, Tregothnan, Probus, Cornwall: FIRST PRIZE, 30*l*., for "Sirloin" (1443), 4 years, 8 months, 3 weeks, 2 days-old; bred by himself; sire, "Lord of the Valley" (1150); dam, "Peach" (2905A), by "Young Forester" (759); g. d., "Picture 4th" (2224), by Davy's "Napoleon 3rd" (464); gr. g. d., "Picture" (337).

ALBERT EDWARD GOULD, Bampfylde Lodge, Poltimore, Exeter: SECOND PRIZE, 15*l*., for "Sir Copplestone," 4 years, 11 months-old; bred by Mr. J. Gould, late of Poltimore, Exeter; sire, "Tempter;" dam, "Mayflower."

ALFRED C. SKINNER, Pound Farm, Bishop's Lydeard, Taunton, Somersetshire: THIRD PRIZE, 10*l*., "Duke of Farrington" (1323), 3 years, 3 weeks, 5 days-old; bred by Mr. R. Farthing, North Petherton, Bridgwater; sire, "The Shah" (1230); dam by "Charlie" (800).

Devon Bulls, above Two and not exceeding Three Years old.

WALTER FARTHING, Stowey Court, Bridgwater: FIRST PRIZE, 25*l*., and the CHAMPION PRIZE, value 50*l*., for "Lord Newsham," 2 years, 7 months, 3 weeks, 6 days-old; bred by himself; sire, "Master James;" dam, "Famous," by "Son of Lord Quantock;" g. d., "Famous," by "Duke of Chester;" gr. g. d., "Famous," by "Sultan."

Viscount Falmouth, Tregothnan, Probus, Cornwall: Second Prize, 15*l.*, for his 2 years, 10 months, 1 week, 2 days-old; bred by himself; sire, "Duke of Tregothnan" (1324); dam, "Brunette" (3240), by "Sunflower" (937); g. d., "Cinnaminta" (2572B), by "Protector" (711); gr. g. d., "Gipsy Queen."

Colonel Buller, C.B., Downes, Crediton, Devonshire: Third Prize, 5*l.*, for his 2 years, 3 months, 2 days-old; bred by himself.

Viscount Falmouth, Tregothnan, Probus, Cornwall: the *Reserve Number* to his 2 years, 11 months, 2 weeks, 3 days-old; bred by himself; sire, "Master Flitton" (1160); dam, "Christmas Rose" (3280), by "Sunflower" (937); g. d., "Rosa Bonheur" (3009), by "Corrector" (809); gr. g. d., "Picture 4th" (2224), by Davy's "Napoleon 3rd" (464).

Devon Yearling Bulls, above One and not exceeding Two Years old.

Viscount Falmouth, Tregothnan, Probus, Cornwall: First Prize, 25*l.*, for his 1 year, 10 months, 2 weeks-old; bred by himself; sire, "Sirloin" (1443); dam, "Water Lily" (5050), by "Jonquil" (1131); g. d., "Watercress" (4006), by "Sunflower" (937); gr. g. d., "Cheesewring" (2572A), by "Protector" (711).

Walter Farthing, Stowey Court, Bridgwater, Somerset: Second Prize, 15*l.*, for his 1 year, 1 month, 6 days-old; bred by himself; sire, "Nelson;" dam, "Duchess 2nd," by "Forester;" g. d., "Duchess," by "Able;" gr. g. d., "Dairymaid," by "Viscount."

George Turner, Great Bowley, Tiverton, Devon: Third Prize, 5*l.*, for his 1 year, 11 months-old; bred by Sir Thomas Boughey, Bart., Newport, Salop.

William Perry, of Alder, Lewdown, Devon: the *Reserve Number* to "Druid," 1 year, 8 months, 3 weeks, 2 days-old; bred by himself; sire, "Dalesman" (1310); dam, "Dewdrop" (3392), by "Champson" (1035); g. d., "Dairymaid" (3343), by "Baronet" (781); gr. g. d., "Dairymaid" (1900), by "Duke of Chester" (404).

Devon Bull Calves, above Six and under Twelve Months old.

William Rolles Fryer, Lytchett Minster, Poole, Dorset: First Prize, 15*l.*, for "Sweet William," 10 months, 1 week-old; bred by Viscount Portman, Bryanston; sire, "Young Palmerston" (1251); dam, "Famous" (4450), by "Duke of Plymouth" (1080); g. d., "Famous;" gr. g. d., "Fruitful" (3524), by "Exeter" (1098).

Colonel Buller, C.B., Downes, Crediton, Devon: Second Prize, 10*l.*, for his 9 months, 2 weeks, 1 day-old; bred by himself.

William Rolles Fryer, Lytchett Minster: Third Prize, 5*l.*, for "Daffodil," 11 months, 4 weeks-old; bred by Viscount Portman, Bryanston, Blandford; sire, "The Baron" (1459); dam, "Betsy" (4109), by "Viscount" (1235); g. d., "Barrett."

Walter Farthing, Stowey Court, Bridgwater, Somerset: the *Reserve Number* to his 8 months, 2 weeks, 2 days-old; bred by himself; sire, "Royal Aston;" dam, "Charlotte," by "Sir George;" g. d., "Cheerful," by "St. Audries."

Devon Cows, above Three Years old.

WALTER FARTHING, Stowey Court, Bridgwater, Somerset: FIRST PRIZE, 20*l*., and the CHAMPION PRIZE, value 50*l*., for "Prettyface," 6 years, 6 months, 1 week, 3 days-old, in-milk and in-calf, calved Sept. 12, 1878; bred by himself; sire, "Lovely Duke;" dam, "Prettyface," by "Sir George;" g. d., "Young Pink," by "Viscount;" gr. g. d., "Pink," by "Sir Peregrine."

MRS. MARIA LANGDON, Flitton Barton, North Molton, Devon: SECOND PRIZE, 10*l*., for "Temptress 8th" (5001), 3 years, 1 month, 2 weeks, 2 days-old, in-calf; bred by herself; sire, "Duke of Flitton 10th" (1074); dam, "Temptress 5th" (3963), by "Duke of Flitton 5th" (1069); g. d., "Temptress 2nd" (3070), by "Duke of Cornwall" (820); gr. g. d., "Gold Medal Temptress" (1672), by "Napoleon 3rd" (464).

WILLIAM PERRY, Alder, Lewdown, Devon: THIRD PRIZE, 5*l*., for "Comely" (3287), 6 years, 7 months, 1 week, 6 days-old, in-calf; bred by himself; sire, "Champson" (1035); dam, "Chivy" (3279).

WILLIAM ROLLES FRYER, Lytchett Minster, Poole: the *Reserve Number* to "Bluebell" (4114), 5 years, 6 months, 3 weeks, 3 days-old, in-milk, calved May 11, 1879; bred by Viscount Portman, Bryanston, Blandford; sire, "Emperor" (1096); dam, "Broad" (4152).

Devon Heifers, in-milk or in-calf, above Two and not exceeding Three Years old.

WALTER FARTHING, Stowey Court, Bridgwater, Somerset: FIRST PRIZE, 15*l*., for "Prettyface 2nd," 2 years, 9 months, 2 days-old, in-calf; bred by himself; sire, "Master Willie;" dam, "Prettyface," by "Lovely Duke;" g. d., "Prettyface," by "Sir George;" gr. g. d., "Young Pink," by "Viscount."

MRS. MARIA LANGDON, Flitton Barton: SECOND PRIZE, 10*l*., for "Temptress 12th" (5005), 2 years, 4 weeks-old, in-calf; bred by herself; sire, "Jonquil" (1131); dam, "Temptress 2nd" (3070), by "Duke of Cornwall" (820); g. d., "Gold Medal Temptress" (1672), by Davy's "Napoleon 3rd" (464); gr. g. d., "Pink" (955), by "Nelson" (83).

HER MAJESTY THE QUEEN, Windsor Castle: THIRD PRIZE, 5*l*., for "Princess Beatrice," 2 years, 11 months, 1 week-old, in-calf; bred by Her Majesty, Norfolk Farm, Windsor; sire, "Prince George Frederick;" dam, "Rose Bud," by "Prince Imperial;" g. d., "Hager 2nd," by "Island Prince;" gr. g. d., "Hager," by "Challenger."

MRS. MARIA LANGDON, Flitton Barton: the *Reserve Number* to "Temptress 10th" (5003), 2 years, 5 months-old, in-calf; bred by herself; sire, "Jonquil" (1131); dam, "Temptress 4th" (3962), by "Duke of Flitton 4th" (827); g. d., "Gold Medal Temptress" (1672), by Davy's "Napoleon 3rd" (464); gr. g. d., "Pink" (955), by "Nelson" (83).

Devon Yearling Heifers, above one and not exceeding Two Years old.

WILLIAM ROLLES FRYER, Lytchett Minster, Poole, Dorset: FIRST PRIZE, 15*l*., for "Kalmia," 1 year, 11 months, 3 weeks, 1 day-old; bred by Viscount Portman, Bryanston, Blandford, Dorset; sire, "The Earl" (1464); dam, "Quail" (4880), by "Emperor" (1096); g. d., "Queen" (4886).

WALTER FARTHING, Stowey Court, Bridgwater: SECOND PRIZE, 10*l.*, for "Famous 2nd," 1 year, 8 months, 3 weeks, 3 days-old; bred by himself; sire, "Master Willie;" dam, "Famous," by "Son of Lord Quantock;" g. d., "Famous," by "Duke of Chester;" gr. g. d., "Famous," by "Sultan."

WILLIAM ROLLES FRYER, Lytchett Minster: THIRD PRIZE, 5*l.*, for "Bouquet," 1 year, 10 months, 3 days-old; bred by himself; sire, "The Earl" (1464); dam, "Balsam" (4056), by "Emperor" (1096); g. d., "Blanche" (3215), by "Prince Albert" (907); gr. g. d., "Beauty."

JOHN WALTER, M.P., Bearwood, Wokingham, Berks: the *Reserve Number* to "Famous 4th," 1 year, 4 months, 2 weeks-old; bred by himself; sire, "Master Willie" (1411); dam, "Famous 2nd," by "Eclipse" (835); g. d., "Famous," by "Gold Seeker" (848); gr. g. d., "Flitton."

Devon Heifer Calves, above six and not exceeding Twelve Months old.

WALTER FARTHING, Stowey Court, Bridgwater, Somerset: FIRST PRIZE, 15*l.*, for "Famous 3rd," 7 months, 4 weeks, 1 day-old; bred by himself; sire, "Royal Aston;" dam, "Famous," by "Son of Lord Quantock;" g. d., "Famous," by "Duke of Chester;" gr. g. d., "Famous," by "Sultan."

WILLIAM ROLLES FRYER, of Lytchett Minster: SECOND PRIZE, 10*l.*, for "Hyacinth," 10 months, 2 weeks, 1 day-old; bred by himself; sire, "Sultan" (1455); dam, "Balsam" (4056), by "Emperor" (1096); g. d., "Blanche" (3215), by "Prince Albert" (907); gr. g. d., "Beauty;" and the *Reserve Number* to "Columbine," 10 months, 2 weeks, 1 day-old; bred by himself; sire, "Sultan" (1455); dam, "Cherry" (4208), by "Emperor" (1096); g. d., "Cherry;" gr. g. d., "Champion."

Sussex Bulls, above Three Years old.

GEORGE SMITH, Paddockhurst, Crawley, Sussex: FIRST PRIZE, 20*l.*, for "Young Hartley," dark red, 4 years, 11 months, 1 week, 6 days-old; bred by himself; sire, "Hartley;" dam, "Young Broad," by "Monarch" (20).

EDWARD and ALFRED STANFORD, Eatons, Ashurst, Steyning, Sussex: SECOND PRIZE, 10*l.*, for "Dorchester," 7 years, 7 months, 3 weeks-old; bred by themselves; sire, "Volunteer;" dam, "Mary Fern" (1189), by "Westminster" (138); g. d., "Fanny Fern" (789), by "Sir Marmaduke" (38); gr. g. d., "Virgin" (621).

HENRY PAGE, Walmer Court, Walmer, Kent: THIRD PRIZE, 5*l.*, for "Mayfield," dark red, 3 years, 8 months, 2 days-old; bred by Mr. B. Noakes, Gillhope, Mayfield, Sussex.

EDWARD and ALFRED STANFORD, Eatons, Ashurst, Steyning, Sussex: the *Reserve Number* to "Tunbridge," red, 4 years, 5 months, 3 weeks, 4 days-old; bred by themselves; sire, "Dorchester;" dam, "Marvel" (1188).

Sussex Bulls, above Two and not exceeding Three Years old.

LOUIS HUTH, Possingworth Manor, Waldron, Hawkhurst: FIRST PRIZE, 20*l.*, for "Sir William," red, 2 years, 11 months, 2 weeks, 6 days-old; bred by himself; sire, "Reeves;" dam, "Gentle 1st;" g. d., "Gentle."

CHARLES ELLIS, Preston House, Beddingham, Lewes, Sussex: SECOND PRIZE, 10*l.*, for "Napoleon 1st," red, 2 years, 5 months, 4 weeks-old; bred by himself; sire, "Kingsley;" dam, "Beauty," by "Monarch;" g. d., "Butterfly."

CHARLES WHITEHEAD, Barming House, Maidstone, Kent: THIRD PRIZE, 5*l.*, for "Redheart" (360), red, 2 years, 9 months, 3 weeks, 4 days-old; bred by Messrs. Stanford, Eatons, Steyning; sire, "Bedford;" dam, "Marvel" (1223).

JOSEPH RICKETT, Barnham House, East Hoathley, Hawkhurst: the *Reserve Number* to "Rufus," dark red, 2 years, 7 months, 3 weeks, 6 days-old; bred by himself; dam, "Beauty."

Sussex Yearling Bulls, above One Year and not exceeding Two Years old.

JAMES STEWART HODGSON, Lythe Hill, Haslemere, Surrey: FIRST PRIZE, 15*l.*, and the CHAMPION PRIZE,† value 25*l.*, for "Oxford" (304), red, 1 year, 9 months, 2 weeks, 4 days-old; bred by Mr. A. Agate, Broomhall, Horsham; sire, "Berry" (259); dam, "Honesty 2nd" (1618), by "Alfred 2nd" (177); g. d., "Honesty" (1333), by "Grand Duke" (183); gr. g. d., "Honesty" (443).

THE RIGHT HON. THE SPEAKER, Glynde Place, Lewes, Sussex: SECOND PRIZE, 10*l.*, for "Stanford," red, 1 year, 9 months, 3 weeks, 1 day-old; bred by Messrs. E. and A. Stanford; sire, "Dorchester;" dam, "Strawberry" (1565).

EDWARD and ALFRED STANFORD, Eatons, Ashurst, Steyning: THIRD PRIZE, 5*l.*, for "Southampton," red, 1 year, 10 months, 2 weeks, 4 days-old; bred by themselves; sire, "Bedford;" dam, "Rosedew 1st," by "Dorchester."

ALFRED AGATE, Broomhall Farm, Warnham, Horsham, Sussex: the *Reserve Number* to "Berry 1st" (292), red, 1 year, 9 months-old; bred by himself; sire, "Berry" (259); dam, "Actress 4th" (1676), by "Grand Duke" (183).

Sussex Bull Calves, above Six and not exceeding Twelve Months old.

JOHN and ALFRED HEASMAN, Angmering, Worthing, Sussex: FIRST PRIZE, 10*l.*, for "Royal Kilburn" (363), red, 10 months, 3 weeks, 2 days-old; bred by themselves; sire, "Hereford" (263); dam, "Cherry" (1244), by "William" (139); g. d., "Leicester" (1120), by "Prince Arthur" (129); gr. g. d., "Plymouth" (1024), by "The Duke" (97): and SECOND PRIZE, 5*l.*, for "Weston" (376), red, 7 months, 1 week-old; bred by themselves; sire, "Calcetto" (273); dam, "Sandgate" (1661).

EDWARD and ALFRED STANFORD, Eatons, Ashurst, Steyning, Sussex: the *Reserve Number* to "Prince," red, 11 months, 2 weeks-old; bred by themselves; sire, "Dorchester;" dam, "Strawberry" (1565).

Sussex Cows, above Three Years old.

JAMES BRABY, Maybanks, Rudgwick, Sussex: FIRST PRIZE, 20*l.*, and the CHAMPION PRIZE,† value 25*l.*, for "Bouncer" (1472), red, 7 years, 3 months, 2 weeks-old, in-calf; bred by himself; sire, "Jupiter" (170); dam, "Beauty" (1151), by "Blackstone" (68).

† Given by Sussex breeders.

BLAKE DUKE, Lyminster, Arundel, Sussex: SECOND PRIZE, 10*l.*, for "Primrose," red, 10 years, 5 months, 3 weeks, 2 days-old, in-milk, calved January 28, 1879; bred by himself; sire, "Mayfield;" dam, "Lofty," by "Selmeston."

JOHN and ALFRED HEASMAN, Angmering, Arundel, Sussex: THIRD PRIZE, 5*l.*, for "Snowdrop" (1727), red, 5 years, 8 months, 5 days-old, in-milk and in-calf, calved August 1, 1878; bred by themselves; sire, "Egerton;" dam, "Leicester" (1120), by "Prince Arthur" (129); g. d., "Plymouth" (1024), by "The Duke" (97); gr. g. d., "Gentle" (574).

GEORGE C. COOTE, Tortington, Arundel, Sussex: the *Reserve Number* to his red, 4 years, 10 months, 2 weeks, 2 days-old, in-calf; bred by himself.

Sussex Heifers, in-milk or in-calf, above Two and not exceeding Three Years old.

JAMES BRABY, Maybanks, Rudgwick, Sussex: FIRST PRIZE, 15*l.*, for "Rival" (1813), red, 2 years, 9 months, 1 week, 1 day-old, in-calf; bred by Messrs. Heasman, Angmering, Arundel; sire, "Calcetto" (273); dam, "Firle" (1262).

CHARLES WHITEHEAD, Barming House, Maidstone: SECOND PRIZE, 10*l.*, for "Cherry Jam," red, 2 years, 3 months, 3 days-old, in-calf; bred by himself; sire, "May Duke" (252); dam, "Flemish" (1357), by "Emperor;" g. d., "Cherry" (1298).

THOMAS B. LANSDELL, Lamberhurst, Hawkhurst, Kent: THIRD PRIZE, 5*l.*, for "Daisy," red, 2 years, 2 months, 2 weeks, 1 day-old, in-calf; bred by himself.

JOHN and ALFRED HEASMAN, Angmering: the *Reserve Number* to "Princess," red, 2 years, 5 months-old, in-calf; bred by themselves; sire, "Croydon" (245); dam, "Pride of Ham" (1436), by "Southampton" (155); g. d. "Cherry" (1244), by "William" (139); gr. g. d., "Leicester" (1120), by "Prince Arthur" (129).

Sussex Yearling Heifers, above One and not exceeding Two Years old.

JOHN and ALFRED HEASMAN, Angmering, Arundel, Sussex: FIRST PRIZE, 15*l.*, for "Peace," red, 1 year, 9 months, 3 weeks-old; bred by themselves; sire, "Croydon" (24); dam, "Snowdrop" (1727), by "Egerton;" g. d., "Leicester" (1120), by "Prince Arthur" (129); gr. g. d., "Plymouth" (1024), by "Duke" (97): and SECOND PRIZE, 10*l.*, for "Famous," red, 1 year, 6 months, 4 weeks-old; bred by themselves; sire, "Hereford" (263); dam, "Reeve," by "Egerton."

EDWARD and ALFRED STANFORD, Eatons, Ashurst, Steyning: THIRD PRIZE, 5*l.*, for "Marigold 4th," red, 1 year, 11 months, 4 weeks, 3 days-old; bred by themselves; sire, "Tunbridge;" dam, "Marigold 3rd," by "Mayfield;" g. d., "Marigold 2nd," by "Young Westminster" (159); gr. g. d., "Marigold" (1187).

JAMES BRABY, Maybanks, Rudgwick, Sussex: the *Reserve Number* to "Vernal," red, 1 year, 11 months, 4 weeks-old; bred by himself; sire, "Robinson Crusoe" (267); dam, "Vanity" (1731), by "Jonah" (187); g. d., "Virgin;" gr. g. d., "Strawberry," by "Midsummer."

Sussex Heifer Calves, above Six and not exceeding Twelve Months old.

Blake Duke, Lyminster, Arundel: First Prize, 10*l.*, for his red, 10 months, 1 day-old; bred by himself; sire, "Hereford;" dam, "Duchess," by "Sir Roger;" g. d., "Lofty," by "Selmeston."

Thomas B. Lansdell, Lamberhurst, Hawkhurst, Kent: Second Prize, 5*l.*, for "Daphne," red, 11 months, 2 weeks-old; bred by himself.

John and Alfred Heasman, Angmering, Worthing: the *Reserve Number* to their red, 9 months, 2 weeks, 1 day-old; bred by themselves; sire, "Hereford" (263); dam, "Crocus" (1692), by "Lord of Lorne" (207); g. d., "Cheerful."

Longhorn Bulls, above Three Years old.

Major-Gen. Sir F. W. Fitzwygram, Bart., Leigh Park, Havant, Hants: First Prize, 20*l.*, and the Champion Prize,† value 25 guineas, for "Prince Victor," brindled and white, 5 years, 3 months-old; bred by Mr. Shaw, Fradley Old Hall, Lichfield; sire, "Earl of Upton 7th" (76); dam, "Princess;" g. d., "Victor."

The Duke of Buckingham and Chandos, Stowe, Buckingham: Second Prize, 10*l.*, for "Conqueror 3rd," brindle and white, 7 years, 11 months, 3 weeks-old; bred by himself; sire, "Young Conqueror;" dam, "Lady," by "Boycott;" g. d., "Lally," by "Tamworth;" gr. g. d., "Lovely."

Richard Hall, Thurlston Grove, Derby: Third Prize, 5*l.*, for "Farewell" (81), brindle and white, about 4 years, 4 months-old; bred by Mr. Burbury, Kenilworth; sire, "Crown Prince" (41); dam, "Damsel;" g. d., "Beauty," by "The Baron" (221).

The Duke of Buckingham and Chandos, Stowe: the *Reserve Number* to "Earl of Temple," brindle and white, 4 years, 10 months, 2 weeks, 4 days-old; bred by himself; sire, "Conqueror 3rd;" dam, "Duchess," by "Boycott;" g. d., "Diadem," by "Tamworth;" gr. g. d., "Dolly."

Longhorn Bulls, above Two and not exceeding Three Years old.

John Godfrey, Wigston Parva, Hinckley, Leicestershire: First Prize, 20*l.*, for "The Captain," red and white, 2 years, 3 months, 2 weeks, 4 days-old; bred by himself; sire, "Blue Knight;" dam, "Fair," by "Samson I.;" g. d., "Curly Coat," by "Sparkenhoe;" gr. g. d., "Lady," by "Perfection."

The Duke of Buckingham and Chandos, Stowe, Buckinghamshire: Second Prize, 10*l.*, for "Sambo," brindle and white, 2 years, 9 months, 1 week, 5 days-old; bred by himself; sire, "Earl of Temple;" dam, "Barmaid," by "Conqueror 3rd;" g. d., "Negress," by "Conqueror;" gr. g. d., "Negress," by Boycott."

Longhorn Yearling Bulls, above One and not exceeding Two Years old.

John Godfrey, Wigston Parva, Hinckley, Leicestershire: First Prize, 15*l.*, for "Royal," brindle and white, 1 year, 1 month, 2 weeks, 5 days-old; bred by himself; sire, "Blucher;" dam, "Daisy," by "Shakespeare;" g. d., "Plumb," by "Sampson 2nd."

† Given by the Longhorn Society.

William Smith Shaw, Fradley Old Hall, Lichfield, Staffordshire: Second Prize, 10*l*., for "Sampson 3rd," red and white, 1 year, 3 months, 1 week, 6 days-old; bred by Mr. S. Forrest, The Chase, Kenilworth; sire, "Sirius" (197); dam, "Blue Bell 3rd," by "Crown Prince" (41); g. d., "Blue Bell 2nd," by "Borderer" (9); gr. g. d., "Blue Bell 1st."

Major-General Sir F. Fitzwygram, Bart., Leigh Park, Havant, Hants: Third Prize, 5*l*., for "Count Victor," brindle and white, 1 year, 2 months, 1 week-old; bred by himself; sire "Prince Victor;" dam, "Smokey," by "Tippoo" (232); g. d., "Milehorned Brown," by "Sir Joseph" (198); gr. g. d., "Barhorned Brown," by "Sir Richard."

The Duke of Buckingham and Chandos, Stowe, Buckingham: the *Reserve Number* to "Conqueror 4th," brindle and white, 1 year, 2 months, 1 week, 4 days-old; bred by himself; sire, "Conqueror 3rd;" dam, "Emma," by "Young Conqueror;" g. d., "Evelyn," by "Boycott;" gr. g. d., "Elaine."

Longhorn Cows, above Three Years old.

The Duke of Buckingham and Chandos, Stowe: First Prize, 20*l*., and the Champion Prize,† value 25 guineas, for "Countess of Temple," brindle and white, 4 years, 10 months, 4 days-old, in-milk, calved October 16, 1878; bred by himself; sire, "Conqueror 3rd;" dam, "Lady Mary," by "Young Conqueror;" g. d., "Venus," by "Boycott;" gr. g. d., "Vanity."

Major-General Sir F. Fitzwygram, Bart., of Leigh Park, Havant: Second Prize, 10*l*., for "Fairer," red and white, 5 years, 1 month, 3 weeks, 6 days-old, in-milk, calved March 5, 1879; bred by Mr. J. Godfrey, Wigston Parva, Hinckley; sire, "Shakespeare" (196); dam, "Fair," by "Samson 1st" (192); g. d., "Curly Coat," by "Sparkenhoe" (206); gr. g. d., "Lady," by "Perfection" (161).

Richard Hall, Thurlston Grove, Derby: Third Prize, 5*l*., for "Bodelwyddan 2nd," red and white, 3 years, 2 months, 1 week, 2 days-old, in-calf; bred by himself; sire, "Earl of Upton 3rd" (72); dam, "Maid of Bodelwyddan," by "Messenger" (133); g. d., "Lady Whitacre," by Warner's "Bull" (247); gr. g. d., "Lily," by Weston's "Bull" (263): and the *Reserve Number* to "Calke," brindle and white, 8 years, 3 months, 1 week, 1 day-old, in-calf; bred by Mr. R. H. Chapman, St. Asaphs, North Wales; sire, "Earl of Warwick" (77); dam, "Old Brindled Beauty," by "Sparkenhoe" (206); g. d., "Fillpail," by "Young Rollright" (277); gr. g. d., "Cherry," by "Lord Windsor" (125).

Longhorn Heifers, in-milk or in-calf, above Two and not exceeding Three Years old.

Richard Hall, Thurlston Grove, Derby: First Prize, 15*l*., for "Celia," red and white, 2 years, 2 months, 1 week, 2 days-old, in calf; bred by himself; sire, "Prince Royal" (163); dam, "Calke," by "Earl of Warwick" (77); g. d., "Old Brindled Beauty," by "Sparkenhoe" (206); gr. g. d., "Fillpail," by "Young Rollright" (277): and Second Prize, 10*l*., for "Tulip 2nd," red and white, 2 years, 2 months, 2 weeks, 3 days-old, in-calf; bred by himself; sire, "Prince Royal" (163); dam, "Tulip," by "Lord Warner" (122); g. d., "Nancy," by "Earl of Derby" (60).

† Given by the Longhorn Society.

JOHN GODFREY, Wigston Parva, Hinckley: THIRD PRIZE, 5*l.*, for "Perfection," red and white, 2 years, 4 months, 1 day-old; in-calf; bred by himself; sire, "Blue Knight;" dam, "Milkmaid," by "Sampson 2nd;" g. d., "Tulip," by "The Stranger;" gr. g. d., "Blossom," by "Lord Windsor."

THE DUKE OF BUCKINGHAM AND CHANDOS, Stowe: the *Reserve Number* to "Lady March," red and white, 2 years, 10 months, 1 week, 4 days-old: in-calf; bred by himself; sire, "Earl of Wigston;" dam, "Lady May," by "Wotton;" g. d., "Lady Mary," by "Young Conqueror;" gr. g. d., "Venus," by "Boycott."

Longhorn Yearling Heifers, above One and not exceeding Two Years old.

RICHARD HALL, Thulston Grove, Derby: FIRST PRIZE, 15*l.*, for "Lady Fanny," red and white, 1 year, 4 months, 3 week, 6 days-old; bred by himself; sire, "Prince Royal" (163); dam, "Baroness."

JOHN GODFREY, Wigston Parva, Hinckley: SECOND PRIZE, 10*l.*, for "Victorius," red and white, 1 year, 3 months-old; bred by himself; sire, "Tiger;" dam, "Primrose 1st," by "Red Rover;" g. d., "Last Rose of Summer," by "Conqueror;" gr. g. d., "Lady," by "Perfection."

MAJOR-GEN. SIR F. FITZWYGRAM, Bart., Leigh Park, Havant: THIRD PRIZE, 5*l.*, for "First Link," red and white, 1 year, 3 months, 1 week, 6 days-old; bred by himself; sire, "Prince Victor;" dam, "Upton's Last Link," by "Shakespeare" (196); g. d., "Lady Cake," by "Earl of Warwick" (77); gr. g. d. "Old Brindled Beauty," by "Sparkenhoe" (206).

RICHARD HALL, Thulston Grove, Derby: the *Reserve Number* to "Lady Mary," red and white, 1 year, 2 months, 4 weeks, 1 day-old; bred by himself; sire, "Bluebeard" (6); dam, "Farewell," by "Earl of Upton 6th" (75).

Jersey Bulls, above Two Years old.

JOHN LE BRUN, St. Ouen's, Jersey: FIRST PRIZE, 20*l.*, and the CHAMPION PRIZE,† value 20*l.*, for "Duke" (237), 2 years, 3 months-old; bred by Mr. Philip Hacquoil, St. Ouen's, Jersey; sire, "Sultan;" dam, "Princess."

THE EARL OF ROSSLYN, Easton Lodge, Dunmow, Essex: SECOND PRIZE, 10*l.*, for "Golden Ear" (69); whole colour, 4 years, 3 months, 3 weeks-old; bred by Mr. J. Le Brun, St. Ouen's, St. Helier's, Jersey; sire, "Yankee;" dam, "Dolly" (1362).

WILLIAM ARKWRIGHT, Sutton Scarsdale, Chesterfield, Derbyshire: THIRD PRIZE, 5*l.*, for "Prince Moonshine," smoky fawn, about 4 years, 6 months-old; bred by Mr. Holbrook, Derby; sire, "Bakewell's Madman."

HERBERT ADDINGTON RIGG, Wykeham Lodge, Walton-on-Thames, Surrey: the *Reserve Number* to "Gipsy Lad," silver grey, 3 years, 4 months, 1 week-old; bred by himself; sire, "Gipsy King;" dam, "Topsy," by "Grays."

† Given by the Association for Publishing the English Herd Book of Jersey Cattle.

Jersey Yearling Bulls, above One and not exceeding Two Years old.

Francis Le Brocq, St. Peter's Jersey: First Prize, 20*l.*, for "Farmer's Glory" (276), grey, 1 year, 4 months-old; bred by Mr. F. Becquet, Chestnut Farm, St. Peter's, Jersey; sire, "Grey King" (169);" dam, "Bonheur" (1651).

William Alexander, Gras Fort Farm, St. Martin's, Jersey: Second Prize, 10*l.*, for "Napier," grey fawn, 1 year, 1 month, 1 week, 2 days-old; bred by Mr. J. Cabot, La Commune, Trinity, Jersey; sire, "Gouverneur;" dam, "Bubona 2nd."

Thomas O. Bennett, Tolbury House, Bruton, Somerset: Third Prize, 5*l.*, for "Grey of the East," blue grey, about 1 year, 4 months-old; bred by Mr. J. Le Brocq, St. Clement's, Jersey; sire, "Napier;" dam, "Lily."

Philip Mourant, La Commune, St. Saviour's, Jersey: the *Reserve Number* to "Progress," silver grey; 1 year, 4 months, 4 weeks, 1 day-old; bred by Mr. N. Dufeu, Trinity, Jersey; sire, "Grey King 1st;" dam, "Beauty" (1517), by "Welcome 2nd."

Jersey Bull-Calves.

George Simpson, Wray Park, Reigate, Surrey: First Prize, 10*l.*, for "Hector," silver grey, 11 months, 4 weeks-old; bred by himself; sire, "The Pride," by "Hilda;" dam, "Greylad;" g. d., "Fancy."

William Stallard, Ivy Bank, Worcester: Second Prize, 5*l.*, for "Royalist," silver grey, 10 months, 3 weeks, 3 days-old; bred by himself; sire, "Osborne;" dam, "Maiden," by "Dacre."

Thomas Brown, Old Lodge, Ashdown Forest, Uckfield, Sussex: the *Reserve Number* to "Narcissus," silver grey, 10 months, 3 weeks, 6 days-old; bred by himself; sire, "Bolivar;" dam, "Blue Belle," by "Grey King;" g. d., "Grisette."

Jersey Cows, above Three Years old.

John Philip Marrett, Maison-de-Haut, St. Saviour's, St. Helier's, Jersey: First Prize, 20*l.*, for "Zenobia" (86), light brown, 6 years, 1 month, 1 week, 3 days-old; in-milk, calved March 12, 1879; bred by himself; sire, "Grey King" (40); dam, "Sultana" (7), by "Sultan" (58);" g. d., "Longueville Queen" (272), by "Pretender;" gr. g. d., "Flower," by "Bijou."

Herbert A. Rigg, Wykeham Lodge, Walton-on-Thames, Surrey: Second Prize, 10*l.*, for "Flirt," fawn, about 4 years-old; in-milk, calved April 27, 1879; bred by Mr. John Binet, St. Mary's, Jersey.

George Simpson, Wray Park, Reigate, Surrey: Third Prize, 5*l.*, for "Her Majesty," light fawn, 7 years, 2 months-old; in-milk, calved April 8, 1879; bred by Mr. E. Hubert, St. Ouen's, Jersey; sire, "Jack;" dam, "Camille."

Mrs. Leigh, Luton Hoo Park, Luton, Beds: the *Reserve Number* to "Nancy," dark grey, 4 years, 5 months, 1 week, 1 day-old; in-milk and in-calf, calved January 26, 1879; bred by herself; sire, "Fitz Yankee;" dam, "Old Bonny."

Jersey Heifers, in-milk or in-calf, above Two and not exceeding Three Years old.

SAMUEL BARKER BOOTH, Effingham Lodge, Bickley, Kent: FIRST PRIZE, 20*l.*, and the CHAMPION PRIZE,† value 25*l.*, for "Favourite," grey fawn, 2 years, 2 months, 3 weeks, 4 days-old; in-calf; bred by Mr. P. Le Feuvre, Boulay Bay, Trinity, Jersey; dam, "Sally."

HENRY JAMES CORNISH, Thornford, Sherborne, Dorset: SECOND PRIZE, 10*l.*, for "Souris," silver grey, 2 years, 2 months, 4 days-old; in-calf; bred by Mr. A. Le Heron, St. Helier's, Jersey; sire, "Apollo" (108); dam, "Brunette" (142).

MRS. LEIGH, Luton Hoo Park, Luton, Bedfordshire: THIRD PRIZE, 5*l.*, for "Peggy," dark grey, 2 years, 6 months, 1 week, 5 days-old; in-milk and in-calf, calved March 31, 1879; bred by herself; sire, "Luton Hoo;" dam, "Peggy."

HERBERT ADDINGTON RIGG, Wykeham Lodge, Walton-on-Thames: the *Reserve Number* to "Rosina," fawn, 2 years, 2 months, 1 week, 4 days-old; in-calf; bred by himself; dam, "Flirt."

Jersey Yearling Heifers, above One and not exceeding Two Years old.

GEORGE SIMPSON, Wray Park, Reigate, Surrey: FIRST PRIZE, 15*l.*, for "Milkmaid 3rd," silver grey, 1 year, 10 months, 1 week, 1 day-old; in-milk, calved February 23, 1879; bred by himself; sire, "May Duke;" dam, "Milky," by Ducal;" g. d., "Milkgirl," by "Banboy;" gr. g. d., "Milkmaid," by "Jack Weller."

THOMAS FALLA, jun., Les Buttes, St. John's, Jersey: SECOND PRIZE, 10*l.*, for "Punchinello," light fawn, 1 year, 5 months, 4 days-old; bred by himself; sire, "Vertumnus" (161); dam, "Cowslip" (24), by "Orange Peel" (129); g. d., "Brown Fanny" (594); gr. g. d., "White Rose (593).

SAMUEL BARKER BOOTH, Effingham Lodge, Bickley: THIRD PRIZE, 5*l.*, for "Princess Maud," grey fawn, 1 year, 3 months, 2 weeks, 1 day-old; bred by himself; sire, "Jazel" (158); dam, "Rosy," by "Milord;" g. d. "Rosette."

FRANCIS LABEY, La Patrimoin, St. Helier's, Jersey: the *Reserve Number* to "Pandora 2nd," light fawn, 1 year, 10 months-old; in calf; bred by himself; sire, "My Lord" (119); dam, "Pandora" (1645).

Jersey Heifer-Calves.

JAMES RICHARD CORBETT, Betchworth, Reigate, Surrey: FIRST PRIZE, 10*l.*, for "Brockham Lass No. 3," light fawn, 8 months, 3 weeks, 1 day-old; bred by himself; sire, "Nero;" dam, "Brockham Lass."

JOHN CARDUS, Town Hill, West End, Southampton: SECOND PRIZE, 5*l.*, for "Alice," silver grey, 11 months, 2 days-old; bred by himself; sire, "Dairy King; dam, "Agnes," by "Wellington;" g. d. "Lydiate," by "Chandos;" gr. g. d., "Nellie."

† Given by the Association for Publishing the English Herd Book of Jersey Cattle.

Charles Francis Dorey, East View, Trinity, Jersey: the *Reserve Number* to "Lily of the Valley," fawn, 10 months-old; bred by Mr. P. Le Breton, St. Saviour's, Jersey; sire, "Governor" (138); dam, "Fleur de Lis" (1963).

Guernsey Bulls, above One Year old.

John Richard Newberry, Hill Barton, Heavitree, Exeter: First Prize, 20*l.*, for "Fair Lad," red and white, 3 years, 2 weeks, 3 days-old; bred by Mr. de Moriegried, St. Andrew's, Guernsey; sire, "Billy;" dam, "Polly."

James James, Les Vauxbelets, Guernsey: Second Prize, 10*l.*, for "Squire of Vauxbelets," red and white, 1 year, 7 months, 4 weeks, 1 day-old; bred by himself; sire, "Royal Duke;" dam, "Valentine 1st," by "Forester;" g. d., "Rosy."

Robert Best, St. Andrew's Brickfield, St. Peter's Port, Guernsey: Third Prize, 5*l.*, for "St. Andrew 3rd," red and white, 1 year, 9 months, 3 weeks, 5 days-old; bred by Mr. Roberts, Mauxmarquis, St. Peter's Port, Guernsey; sire, "St. Andrew 1st;" dam, "Rose," by "Billy;" g. d. "Lily."

The Rev. Joshua Rundle Watson, La Favorita, Guernsey: the *Reserve Number* to "Cloth of Gold No. 11," light fawn, 1 year, 5 months, 5 days-old; bred by himself; sire, "Cloth of Gold No. 6;" dam, "Lolla."

Guernsey Cows, above Three Years old.

Rev. Joshua Rundle Watson, La Favorita, Guernsey: First Prize, 20*l.*, for "Florence," dark fawn and white, about 6 years, 2 months-old; in-calf; bred by Mr. C. Le Page, Les Naftieux, St. Andrew's, Guernsey.

Robert N. G. Baker, Heavitree, Exeter: Second Prize, 10*l.*, for "Nancy 2nd," yellow and white, 4 years, 9 months, 2 days-old; in-calf; bred by himself; sire, "Johnnie;" dam, "Nancy 1st," by "Champion."

Robert Best, St. Andrew's Brickfield, St. Peter's Port, Guernsey: Third Prize, 5*l.*, for "Beauty," red and white, 7 years, 9 months, 3 weeks-old; in-calf; bred by Col. Bisset, St. Martin's, St. Peter's Port, Guernsey; sire, "Billy;" dam, "Daisy," by "Johnnie."

Charles Smith, Caledonia Nursery, Guernsey: the *Reserve Number* to "Juno," fawn and white, 6 years, 5 months-old, in-milk; calved April 21, 1879; bred by Col. Giffard, Braye du Valle, Guernsey; sire, "Prince of Orange;" dam, "Princess."

Guernsey Heifers, in-milk or in-calf, above Two and not exceeding Three Years old.

Robert N. G. Baker, Heavitree, Exeter, Devon: First Prize, 20*l.*, for "Bluebell," yellow and white, 2 years, 5 months-old; in-calf; bred by himself; sire, "Johnnie;" dam, "Snowdrop."

William Hood Walrond, New Court, Topsham, Devon: Second Prize, 10*l.*, for "Rosebud," yellow and white, 2 years, 1 month, 3 weeks, 5 days-old; in-calf; bred by himself; sire, "Fairlad;" dam, "Rose," by "Johnnie."

The Rev. John G. Seymour Nichol, Litchfield Rectory, Micheldever, Hants: Third Prize, 5*l*., for "Belle," orange and white, 2 years, 6 months, 6 days-old; in-milk, calved February 14, 1879; bred by himself; dam, "Beauty."

The Rev. Joshua Rundle Watson, La Favorita, Guernsey: the *Reserve Number* to "Cynthia," lemon and white, about 2 years, 2 months-old; in-calf; bred by Mr. Oliver, Richmond, Guernsey.

Norfolk and Suffolk Polled-Bulls, above Two Years old.

Thomas Leonard Palmer, Wilby, Attleborough, Norfolk: First Prize, 20*l*., and the Champion Prize,† value 25*l*., for "Davyson 3rd" (48), red, 5 years, 11 months-old; bred by Mr. J. Hammond, Bale, East Dereham; sire, "The Baron" (9); dam, "Davy 7th," by "Young Duke" (234).

Alfred Taylor, Starston Place, Harleston, Norfolk: Second Prize, 10*l*., for "King Charles" (329), red, 3 years, 1 week, 3 days-old; bred by Mr. J. Foster Palmer, Wilby, Attleboro', Norfolk; sire, "Davyson 3rd" (48); dam, "Young Spot," by "Wilby Chapman" (228).

Jeremiah James Colman, M.P., Carrow House, Norwich: the *Reserve Number* to "Rufus" (188), red, 5 years, 9 months, 1 week-old; bred by the late Lord Sondes, Elsham Hall Farm, East Dereham; sire, "The Palmer;" dam, "Thusford Rose," by "Norfolk Duke."

Norfolk and Suffolk Polled Yearling Bulls, above One and not exceeding Two Years old.

Jeremiah James Colman, M.P., Carrow House, Norwich: First Prize, 15*l*., for "Skobeloff," red, 1 year, 7 months-old; bred by himself; sire, "Lord John;" dam, by "Norfolk Duke:" and Second Prize, 10*l*., for his red, 1 year, 2 weeks, 1 day-old; bred by himself; sire, "Rufus;" dam, "Handsome," by "Norfolk Duke."

Robert Emlyn Lofft, Troston Hall, Bury St. Edmunds: Third Prize, 5*l*., for "Stout," red, 1 year, 11 months, 2 weeks-old; bred by himself; sire, "Donald" (291); dam, "Havelocke 5th."

Thomas Leonard Palmer, Wilby, Attleborough, Norfolk: the *Reserve Number* to "Othello," red, 1 year, 11 months, 1 day-old; bred by the late Mr. J. Foster Palmer, Wilby; sire, "Davyson 3rd" (48); dam, "Cheerful," by "Young Major" (235); g. d., "Spot," by "Wonder" (231); gr. g. d., "Rose K. 19."

Norfolk and Suffolk Polled Cows, above Three Years old.

Robert Emlyn Lofft, Troston Hall, Bury St. Edmunds: First Prize, 15*l*., for "Minnie 3rd," red, 8 years, 4 months, 2 weeks, 1 day-old; in-milk and in-calf, calved Dec. 1, 1878; bred by the late Lord Sondes, Hall Farm, Elmham; sire, "Hammond" (81); dam, "Minnie."

John Hammond, Bale, Dereham, Norfolk: Second Prize, 10*l*., for "Davy 18th," red, 3 years, 5 months-old, in-milk; calved Feb. 15, 1879; bred by himself; sire, "Davyson 3rd;" dam, "Davy 10th," by "Sir Nicholas."

† Given by the Breeders and Exhibitors of Norfolk and Suffolk Polled Cattle.

ROBERT EMLYN LOFFT, Troston Hall: THIRD PRIZE, 5*l.*, for "Handsome 6th," red, 4 years, 8 months, 2 weeks, 1 day-old; in-milk and in-calf, calved July 15, 1878; bred by himself; sire, "Cherry Duke;" dam, "Handsome 2nd."

Norfolk and Suffolk Polled Heifers, in-milk or in-calf, above Two and not exceeding Three Years old.

ALFRED TAYLOR, Starston Place, Harleston, Norfolk: FIRST PRIZE, 15*l.*, and the CHAMPION PRIZE,† value 25*l.*, for "Flirt," red, 2 years, 11 months, 5 days-old; in-calf; bred by himself; sire, "Easton Duke" (61); dam, "Sly," by "Sir Edward I." (197); g. d., "Strawberry II.," by "Richard II." (173); gr. g. d., "Tiny," by "Laxfield Sire" (101).

JOHN HAMMOND, Bale, Dereham, Norfolk: SECOND PRIZE, 10*l.*, for "Beauty 3rd," red, 2 years, 6 months-old; in-calf; bred by himself; sire, "Davyson 4th;" dam, "Beauty 2nd," by "Davyson 3rd."

HENRY BIRKBECK, Stoke Holy Cross, Norwich: THIRD PRIZE, 5*l.*, for "Topsey," red, 2 years, 8 months, 3 days-old; in-calf; bred by himself; sire, "Count" (275); dam, "Zit 3rd T. 4," by "Norfolk Duke."

ROBERT EMLYN LOFFT, of Troston Hall: the *Reserve Number* to "Handsome 8th," red, 2 years, 11 months, 4 days-old; in-milk, calved March 31, 1879; bred by himself; sire, "Bright" (267); dam, "Handsome 5th."

Norfolk and Suffolk Polled Yearling Heifers, above One and not exceeding Two Years old.

GEORGE GOODENHAM, Monewden, Wickham Market, Suffolk: FIRST PRIZE, 15*l.*, for "Wild Rose 2nd," blood-red, 1 year, 5 months, 3 weeks, 4 days-old; bred by himself; sire, "Troston" (424); dam, "Wild Rose," by "The Claimant;" g. d., "Rosy VI.," by "Perfection;" gr. g. d., "Beauty 6th," by "Wonder."

GEORGE GOODENHAM, Monewden, Wickham Market: SECOND PRIZE, 10*l.*, for "Cherry 2nd," blood-red, 1 year, 3 months, 2 weeks, 1 day-old; bred by himself; sire, "Troston 1st" (424); dam, "Cherry 1st," by "King Alfred" (96); g. d., "Fillpail," by "Wonder" (230).

JEREMIAH JAMES COLMAN, M.P., Carrow House, Norwich: THIRD PRIZE, 5*l.*, for red, 1 year, 6 months-old; bred by himself; sire, "Roundhead;" dam, "Silence."

ROBERT EMLYN LOFFT, Troston Hall, Bury St. Edmunds: the *Reserve Number* to "Primrose," red, 1 year, 9 months, 3 weeks-old; bred by himself; sire, "Bright" (269); dam, "Primrose."

Welsh Bulls, above Two Years old.

EARL CAWDOR, Stackpole Court, Pembroke: FIRST PRIZE, 20*l.*, for "Prince of Wales" (63), black, 4 years, 5 months, 2 weeks-old; bred by Mr. Prosser, Llanrian, Haverfordwest, Pembroke; sire, "Ap Gelert;" dam, "Ruth 2nd;" g. d., "Ruth 1st."

CAPTAIN JOHN CHARLES BEST, Plas-yn-Vivod, Llangollen, Denbighshire: SECOND PRIZE, 10*l.*, for "Tom," black, 3 years, 2 months, 4 days-old; bred by Mr. David Owen, Conway, Carnarvonshire.

---

† Given by Breeders and Exhibitors of Norfolk and Suffolk Polled Cattle.

CHARLES SALUSBURY MAINWARING, Llaethwryd, Corwen, Denbighshire: THIRD PRIZE, 5*l.*, for "Taihirion," black, 4 years, 2 months, 3 weeks, 3 days-old; bred by Mr. Roberts, Taihirion, Llanriost, Denbigh.

JOHN SLATER WILKINSON, Paskeston, Pembroke: the *Reserve Number* to "The Devil," black, 2 years, 5 months-old; bred by Mr. Griffiths, of Penalby, Tenby, Pembroke.

Welsh Yearling Bull, above One and not exceeding Two Years old.

CAPTAIN JOHN CHARLES BEST, Plas-yn-Vivod, Llangollen: FIRST PRIZE, 15*l.*, for "Black Prince," black, 1 year, 8 months, 3 days-old; bred by himself; sire, "Prince Llewellyn 2nd;" dam, "Bwlchfedwen," by "Prince of Wales 1st."

THOMAS JONES, Taiucha Hafod Elwy, Cerrig-y-Druidion, Denbigh: SECOND PRIZE, 10*l.*, for "Prince Albert," black, 1 year, 3 months, 3 weeks, 6 days-old; bred by himself; sire, "Tywysag;" dam, "Lady."

WILLIAM EVANS, Posty, Bletherstone, Pembroke: the *Reserve Number* to "Prince 2nd of Dungleddy," black, 1 year, 7 months, 3 weeks, 6 days-old; bred by himself; sire, "Prince of Dungleddy" (58); dam, "Snowdrop," by "Young Lydstep;" g. d., "Penken," by "Billy of Rowston;" gr. g. d., "Lylly," by Lydstep."

Welsh Cows, above Three Years old.

CAPTAIN JOHN CHARLES BEST, Plas-yn-Vivod, Llangollen: FIRST PRIZE, 15*l.*, for "Black Queen," black, 9 years, 1 month, 2 weeks, 1 day-old; in-calf, calved Aug. 1, 1878; bred by Mr. R. Humphreys, Royal Goat Hotel, Beddgelert, Carnarvonshire.

EDWARD ELIAS, Gorswen, Conway, Carnarvonshire: SECOND PRIZE, 10*l.*, for "Mwynic," black, 4 years, 3 months, 2 weeks, 3 days-old; in-calf, calved Sept. 25, 1878; bred by himself.

EARL CAWDOR, Stackpole Court, Pembroke: THIRD PRIZE, 5*l.*, for "Lady," black, 10 years, 3 months, 2 weeks-old; in-calf; bred by Mr. J. Walters, Molfre Isa, Carmarthen; sire, "Lady."

CAPTAIN JOHN CHARLES BEST, Plas-yn-Vivod: the *Reserve Number* to "Welsh Duchess," black, 7 years, 3 weeks, 2 days-old; in-milk and in-calf, calved Nov. 4, 1878; bred by Mr. R. Humphreys, Royal Goat Hotel, Beddgelert, Carnarvonshire; sire, "Prince of Wales 1st;" dam, "Jenny."

Welsh Heifers, in-Milk or in-Calf, above Two and not exceeding Three Years old.

EDWARD ELIAS, Gorswen, Conway, Carnarvonshire: FIRST PRIZE, 15*l.*, for "Mwynder mon," black, 2 years, 9 months-old; in-calf; bred by Mr. Thomas Owen, Pen-y-Mynydd, Holyhead, Anglesea.

CHARLES SALUSBURY MAINWARING, Llaethwryd, Corwen, Denbighshire: SECOND PRIZE, 10*l.*, for "Conway," black, 2 years, 5 months, 3 weeks, 4 days-old; in-calf; bred by Mr. R. Roberts, Taihirion, Llanriost, Denbigh.

JOHN DAVIES, Alleston, Pembroke: THIRD PRIZE, 5*l.*, for "Blossom," black, 2 years, 4 months, 1 week-old; in-calf; bred by himself; sire, "Shah" (20); dam, "Countess" (82); g. d., "Tulip."

EARL CAWDOR, Stackpole Court, Pembroke: the *Reserve Number* to "Leonora," black, 2 years, 11 months, 6 days-old; in-calf; bred by Mr. Morgan, Lamphey, Pembroke; sire, "Trebover;" dam, "Leda;" g. d. "Martha."

Welsh Yearling Heifers, above One and not exceeding Two Years old.

JOHN GRIFFITHS, of Penallycourt, Tenby, Pembrokeshire: FIRST PRIZE, 15*l.*, for "Topaz," black, 1 year, 3 months, 3 weeks, 3 days-old; bred by himself; sire, "Hobart Pasha;" dam, "Tenby," by "Pinkeye;" g. d., "Fancy."

CHARLES SALUSBURY MAINWARING, Llaethwryd, Corwen: SECOND PRIZE, 10*l.*, for "Norfydd," black, 1 year 6 months, 3 weeks-old; bred by himself; sire, "Taihirion;" dam, "Beris."

JOHN GRIFFITHS, Penallycourt: THIRD PRIZE, 5*l.*, for "Dewdrop," black, 1 year, 8 months, 2 weeks, 5 days-old; bred by himself; sire, "Hobart Pasha;" dam, "Daisy," by "Billy;" g. d., "Daisy."

EARL CAWDOR, Stackpole Court, Pembroke: the *Reserve Number* to "Blodwen," black, 1 year, 4 months, 1 week-old; bred by Mrs. Lettice Williams, Love Lodge, Llandilo, Carmarthenshire; sire, "Tichborne 2nd" (64); dam, "Rosal" (144), by "Lover;" g. d., "Victoria," by "Irving;" gr. g. d. "Queen."

Ayrshire Bulls, above Two Years old.

ANDREW MONTGOMERY, Boreland, Castle Douglas, Kirkcudbright: FIRST PRIZE, 15*l.*, for "Marquis of Drumlanrig," white and brown, 4 years, 2 months-old; bred by the late Mr. William Smith, Chanlockfort, Thornhill, Dumfries; sire, "Shah;" dam, "Baby."

MAJOR CARLYON, Alperton Lodge, Ealing, Middlesex: SECOND PRIZE, 10*l.*, for "Allan," red and white, 2 years, 8 months-old; bred by Her Majesty the Queen, Prince Consort's Shaw Farm, Windsor, Berkshire; sire, "Hendon Bull;" dam, "Jean;" g. d., "Victoria," by "Rob Roy."

GEORGE FERME, Leigham Lodge Farm, Roupell Park, Streatham Hill, Surrey: the *Reserve Number* to "Seafield," brown and white, 5 years-old; bred by Mr. John Meikle, Seafield Farm, Bathgate, Linlithgowshire.

Ayrshire Yearling Bulls, above One and not exceeding Two Years old.

ANDREW MONTGOMERY, Boreland, Castle Douglas: FIRST PRIZE, 15*l.*, for "Clarendon of Drumlanrig," white, 1 year, 1 month, 4 weeks, 1 day-old; bred by the Duke of Buccleuch, Drumlanrig, Manhill, Dumfries; sire, "Munnoch of Drumlanrig;" dam, "Modesty," by "Craig Villa."

GEORGE FERME, Leigham Lodge Farm, Roupell Park, Streatham Hill, Surrey: SECOND PRIZE, 10*l.*, for his brown and white, 1 year-old; breeder unknown.

ARTHUR JERVOISE SCOTT, Rotherfield Park, Alton, Hants: the *Reserve Number* to "Carmuirs 8th," red and white, 1 year, 2 months, 3 weeks, 3 days-old; bred by himself; sire, "Bruce" (5); dam, "Carmuirs," by "Inveravon;" g. d., "Spotty," by "Tillichewan."

Ayrshire Cows, above Three Years old.

ANDREW MONTGOMERY, Boreland, Castle Douglas: FIRST PRIZE, 15*l.*, for "Fancy of Drumlanrig," red and white, 5 years, 3 months-old; in-calf; bred by Mr. Andrew Allen, Munnoch, Daby, Ayrshire; sire, "Tweedie;" dam, "Beauty."

THE STAND STUD COMPANY, Whitefield, Manchester: SECOND PRIZE, 10*l.*, for his "Dairy Maid," red and white, about 5 years-old; in-milk, calved April 13, 1879; breeder unknown.

GEORGE FERME, Leigham Lodge Farm, Roupell Park, Streatham Hill, Surrey: the *Reserve Number* to his brown and white, about 4 years-old; in-calf; breeder unknown.

Ayrshire Heifers, in-Milk or in-Calf, above Two and not exceeding Three Years old.

THE STAND STUD COMPANY, Whitefield: FIRST PRIZE, 15*l.*, for "Sunflower," red and white, about 2 years, 10 months-old; in-milk; breeder unknown.

ANDREW MONTGOMERY, Boreland, Castle Douglas: SECOND PRIZE, 10*l.*, for "Hannah 2nd," white and brown, 2 years, 4 months, 2 weeks, 4 days-old; in-calf; bred by the Duke of Buccleuch, Drumlanrig, Manhill, Dumfries; sire, "Bruntwoodhill;" dam, "Hannah."

THE STAND STUD COMPANY, Whitefield: THIRD PRIZE, 5*l.*, for "Beauty;" red and white, about 2 years, 10 months-old; in-milk; breeder unknown.

GEORGE FERME, Leigham Lodge Farm, Roupell Park, Streatham Hill, the *Reserve Number* to his brown and white, 2 years-old; in-calf; breeder unknown.

Polled Galloway Bulls, above Two Years old.

JAMES LITTLE, Fauld, Longtown, Cumberland: FIRST PRIZE, 20*l.*, for "Lord Walter" (1024), black, 3 years, 5 months, 2 weeks-old; bred by the Duke of Buccleuch, Tibbero, Thornhill, Dumfries; sire, "Black Prince" (546); dam, "Louisa" (1642), by "Balig" (729): and SECOND PRIZE, 10*l.*, for "Liddesdale" (1031), black, 3 years, 5 months, 5 days-old; bred by Mr. James Graham, Parcelstown, Longtown; sire, "Sim of Whitram" (562); dam, "Semiramis 4th" (1422), by "Willie of Westburnflat" (523); g. d., "Rose of Galloway" (1311), by "Sir James of Balig" (537); gr g. d. "Semiramis" (703), by "Guardsman (23).

Polled Galloway Yearling Bulls, above One and not exceeding Two Years old.

THOMAS GRAHAM, Beanlands Park, Irthington, Carlisle, Cumberland: FIRST PRIZE, 15*l.*, for "Chief of Errington 3rd" (1338), black, 1 year, 5 months, 1 week, 3 days-old; bred by Mr. James Graham, Parcelstown, Longtown, Carlisle; sire, "Sim of Whitram" (462); dam, "Semiramis 6th" (1425), by "Willie of Westburnflat" (523); g. d. "Semiramis 2nd" (1321), by "Glenorcky" (521); gr. g. d., "Rose of Galloway" (1311), by "Sir James of Balig" (537).

JAMES CUNNINGHAM, Tarbreoch, Dalbeattie, Kirkcudbright: SECOND PRIZE, 10*l.*, for "Clarendon" (1350), black, 1 year, 5 months-old; bred by the Duke of Buccleuch, Drumlanrig, Thornhill, Dumfries; sire, "Guardsman" (1021); dam, "Hannah 2nd" (2619), by "Lochinvar" (520); g. d., "Hannah" (1635).

Polled Galloway Cows, above Three Years old.

JAMES GRAHAM, Parcelstown, Longtown, Cumberland: FIRST PRIZE, 15*l.*, for "Forest Queen 2nd" (1423), black, 6 years, 5 months, 3 weeks-old; in-calf, calved March 3, 1879; bred by himself; sire, "Willie of Westburnflat" (523); dam, "Forest Queen" (1314), by "Sir Walter" (536); g. d., "Fair Forester" (1310), by "Hannibal" (201); gr. g. d., "Maid Marian" (706), by "Malcolm" (202).

JAMES CUNNINGHAM, Tarbreoch, Dalbeattie, Kirkcudbright: SECOND PRIZE, 10*l.*, for "Mary Douglas" (3276), black, 6 years old; in-milk, calved April 7, 1879; bred by Mr. W. Beattie, Brisehill, Longtown, Cumberland; sire, "Bob of Denton Hall" (823): and THIRD PRIZE, 5*l.*, for "Bridesmaid" (1674), black, 7 years, 5 months, 2 weeks-old; in-milk, calved Jan. 21, 1879; bred by himself; sire, "Observer" (728); dam, "Mary 2nd" (1671), by "Balig" (729).

Polled Galloways.

H.H.R. THE PRINCE OF WALES, K.G., Sandringham, Norfolk: FIRST PRIZE, 15*l.*, for his black, 2 years, 11 months, 3 weeks-old; in-calf; bred by Mr. Murray, Close Gill, Low Row, Carlisle.

JAMES GRAHAM, Parcelstown, Longtown, Cumberland: SECOND PRIZE, 10*l.*, for "Semiramis 10th" (2971), black, 2 years, 4 weeks, 1 day-old; in-calf; bred by himself; sire, "Sim of Whitram" (562); dam, "Semiramis 2nd" (1321), by "Glenorcky" (521); g. d., "Rose of Galloway" (1311), by "Sir James of Balig" (537); gr. g. d., "Semiramis" (703), by "Guardsman" (23): and THIRD PRIZE, 5*l.*, for "Dinah 3rd," black, 2 years, 8 months, 2 days-old; in-calf; bred by himself; sire, "Sim of Whitram" (562); dam, "Dinah 2nd" (2671), by "Braw Willie" (1051).

H.R.H. THE PRINCE OF WALES, Sandringham: the *Reserve Number* to his black, 2 years, 11 months, 1 week, 1 day-old; in-calf; bred by Mr. Murray, Close Gill, Low Row, Carlisle.

Polled Angus or Aberdeen Bulls, above Two Years old.

SIR GEORGE MACPHERSON GRANT, Bart., Ballindalloch Castle, Elgin, N.B.: FIRST PRIZE, 20*l.*, and the CHAMPION PRIZE,† value 25*l.*, for "Young Viscount" (736), black, 6 years, 2 months-old; bred by William Duff, Hillockhead, Glass, Huntly, Aberdeenshire; sire, "Hampton" (492); dam, "Erica 3rd" (1249), by "Trojar" (402); g. d., "Erica 2nd" (1284), by "Chieftain" (318); gr. g. d., "Erica" (843), by Cupbearer" (59).

THE MARQUIS OF HUNTLY, Aboyne Castle, Aberdeenshire: SECOND PRIZE, for "Monarch," black, 3 years, 3 months, 2 weeks-old; bred by himself; sire, "Pluto" (602); dam, "Madge" (1217), by "Major" (469); g. d., "Ruth" (1169).

† Given by a Committee of Breeders for the best Polled Angus or Aberdeen animal.

Sir William Gordon Gordon-Cumming, Bart., Altyre, Forres, Elgin: Third Prize, 5*l*., for "King of the Valley" (965), black, 4 years, 1 month, 2 weeks, 2 days-old; bred by Mr. John Leonard, Farmton, Alford.

Thomas Leslie Melville Cartwright, Melville House, Ladybank, Fife: the *Reserve Number* to "Black Prince," black, 2 years, 5 months, 3 weeks, 6 days-old; bred by himself; sire, "Prince Imperial" (898); dam, "Lily of Melville" (2272), by "Gainsborough" (596); g. d., "Victoria 6th" (1409), by "Jim Crow 4th" (352); gr. g. d., "Victoria 4th" (908), by "Leo" (349).

Polled Angus or Aberdeen Yearling Bulls, above One and not exceeding Two Years old.

The Earl of Strathmore, Glamis Castle, Glamis, Forfar, N.B.: First Prize, 15*l*., for "Bombastes," black, 1 year, 3 months, 2 weeks, 4 days-old; bred by himself; sire, "Neptune" (1152); dam, "Beauty of Garline" (1267), by "Victor of Ballindalloch" (403); g. d., "Jemima of Garline" (1245), by "Patrick;" gr. g. d., "Croskie 2nd" (1047).

George Bruce, of Wealthyton, Keig, Aberdeenshire, N.B.: Second Prize, 10*l*., for "Cyprus," black, 1 year, 3 months, 2 weeks-old; bred by Peter Cran, Old Morlich, Towie, Aberdeen; sire, "Bogfern" (901); dam, "Nugget of Morlich" (2079), by "Patrick" (782); g. d., "Fancy" (2076), by "Balwyllo Eclipse" (781); gr. g. d., "Beauty" (2072); by "Angus" (45).

Thomas Leslie Melville Cartwright, Melville House, Ladybank, Fife: the *Reserve Number* to "Ebony," black, 1 year, 5 months, 2 weeks, 1 day-old; bred by himself; sire, "Prince Imperial" (898); dam, "Lily of Melville" (2272), by "Gainsborough" (596); g. d., "Victoria 6th" (1409), by "Jim Crow 4th" (352); gr. g. d., "Victoria 4th" (908), by "Leo" (349).

Polled Angus or Aberdeen Cows, above Three Years old.

The Marquis of Huntly, Aboyne Castle, Aberdeenshire: First Prize, 15*l*., for "Madge" (1217), black, 8 years, 2 months, 3 weeks, 5 days-old, in-milk, calved March 26, 1879; bred by Mr. R. Walker, Portlethen, Stonehaven, Kincardineshire; sire, "Major of Tillyfour" (569); dam, "Ruth of Tillyfour" (1169).

John Henry Bridges, Beddington House, Croydon, Surrey: Second Prize, 10*l*., for "Mayflower 3rd," black, 5 years, 2 months-old; in-milk, calved April 4, 1879; bred by Mr. Walker, Mount Cletton, Aberdeenshire; sire, "Hampton" (492); dam, "Mayflower 2nd" (1020): and Third Prize, 5*l*., for "Duchess Marie," black, 5 years, 2 months, 1 week, 5 days-old; in-milk, calved March 27, 1879; bred by Mr. Robert Walker, Mount Cletton, Aberdeenshire; sire, "Hampton" (492); dam, "Daisy" (1025), by "Victor," g. d., "Ballindalloch" (403).

Sir George Macpherson Grant, Bart., Ballindalloch Castle, Elgin, N.B.: the *Reserve Number* to "Siren," black, 7 years, 1 week, 3 days-old; in-milk, calved April 28, 1879; bred by himself; sire, "Juryman" (404); dam, "Sybil" (974), by "Black Prince" (501); g. d., "Ann" (539), by "Banks of Dee" (12).

Polled Angus or Aberdeen Heifers, in-milk or in-calf, above Two and not exceeding Three Years old.

THE MARQUIS OF HUNTLY, of Aboyne Castle, Aberdeenshire: FIRST PRIZE, 15*l.*, for "Princess Royal," black, 2 years, 7 months, 2 weeks, 2 days-old, in-calf; bred by himself; sire, "Dragon;" dam, "Princess 1st of Aboyne," by "Lord Macduff" (678); g. d., "Princess 3rd" (1771).

West Highland Bulls, above Two Years old.

JAMES DUNCAN, Benmore, Kilmun by Greenock, Argyleshire: FIRST PRIZE, 20*l.*, for "Roderick Dhu," black, 5 years, 2 months, 6 days-old; bred by John Stewart Bochastle, Callender, Perth; sire, "Donachadh Dubh."

West Highland Yearling Bulls, above One and not exceeding Two Years old.

JAMES DUNCAN, Benmore, Kilmun, by Greenock, Argyleshire: FIRST PRIZE, 15*l.*, for "Alistair Mohr," light dun, 1 year, 2 months, 3 weeks, 6 days-old; bred by himself; sire, "Donachadh Bàn;" dam, "Mairi Bàn:" and SECOND PRIZE, 10*l.*, for "Lord Colin," yellow, 1 year, 5 months, 2 weeks, 3 days-old; bred by himself; sire, "Donachadh Bàn;" dam, "Dhuberrach."

Kerry Bulls of any age.

JAMES ROBERTSON, La Mancha, Malahide, Co. Dublin: FIRST PRIZE, 20*l.*, for "Busaco," black, 6 years, 2 months-old; breeder unknown.

ROBERT HOGG, LL.D., Streame, Horeham Road, Sussex: SECOND PRIZE, 10*l.*, for "Punch," black, 1 year, 3 months, 3 weeks, 6 days-old; bred by himself; sire, "La Mancha;" dam, "Punchy."

THE EARL OF CLONMELL, Bishop's Court, Straffan, Kildare: THIRD PRIZE, 5*l.*, for "The Kerry Recruit," black, age unknown; bred by the late Sir Gerald Aylmer, Bart., Donadea, Kilcock, Kildare.

JAMES ROBERTSON, La Mancha, the *Reserve Number* to "Border Chief," black, 2 years, 5 months-old; bred by Mr. Eagar, Blanerville, Co. Kerry.

Kerry Cows, or Heifers, in-milk or in-calf.

THE EARL OF CLONMELL, Bishop's Court: FIRST PRIZE, 20*l.*, for "The Pride of Kerry," black, 5 years, 11 months, 2 weeks, 5 days-old, in-milk, calved April 19, 1879; bred by Mr. John O'Sullivan, Killagh, Kenmare, Co. Kerry.

RICHARD GOOD, Aherlow, Co. Cork: SECOND PRIZE, 10*l.*, for "Norah," black, 3 years-old, in-calf; breeder unknown.

PETER HAY, Spike Island, Queenstown, Co. Cork: THIRD PRIZE, 5*l.*, for "Little Beauty," black, about 5 years, 2 months-old, in-milk and in-calf, calved February 8, 1879; bred by Mr. Michael Foley, Killarney, Co. Kerry.

JAMES ROBERTSON, of La Mancha: the *Reserve Number* to "Perilla," black, 4 years, 2 weeks old, in-calf; breeder unknown.

Other British Breeds—Bulls of any age.

THE EARL OF TANKERVILLE, Chillingham Castle, Alnwick, Northumberland: FIRST PRIZE, 20*l*., for "Adam," white Shorthorn, 2 years, 2 weeks-old; bred by himself; sire, a Chillingham wild bull; dam, a pure Shorthorn cow.

JOHN BLOTT, Whalebone House, Chadwell Heath, Essex: SECOND PRIZE, 10*l*., for "Young Cherry," roan Shorthorn, 10 months, 1 week, 2 days-old; bred by himself.

Other British Breeds—Cow or Heifer in-milk or in-calf.

JOHN BLOTT, Whalebone House: FIRST PRIZE, 20*l*., for "Nelly," roan, 3 years, 7 months, 1 week, 3 days-old; in-milk, calved Aug. 22, 1878; bred by himself.

Dairy Cattle—Pairs of Cows in-milk.

FREDERICK HARVEY, Churcham House, Gloucester: FIRST PRIZE, 25*l*., for "Victoria," roan Shorthorn, 7 years, 4 months-old. "Lady," roan Shorthorn, 6 years, 3 months-old; both bred by himself.

J. WELFORD AND SON, Warwick Farm Dairies, Bayswater, London, W.: SECOND PRIZE, 15*l*., for "Buttercup," red, mixed Shorthorn, about 6 years-old. "May," red-pied, mixed Shorthorn, about 6 years old; breeders unknown.

THE STAND STUD COMPANY, Whitefield, Manchester: THIRD PRIZE, 10*l*., for "Fill Pail," roan Yorkshire, 5 years-old. "Rosebud," roan Yorkshire, about 5 years-old; breeders unknown.

WILLIAM PERKINS WARNER, Welsh Harp, Hendon, Middlesex: the *Reserve Number* to "Daisy," red, 5 years-old. "Dolly," roan, 6 years old; breeders unknown.

Dairy Cattle—Cows in-milk.

THE STAND STUD COMPANY, of Whitefield, Manchester; FIRST PRIZE, 25*l*., for "Buttercup," roan Yorkshire, about 5 years-old; in-milk, calved May 25, 1879; breeder unknown.

THOMAS KINGSLEY, 40, New Road, Aylesbury: SECOND PRIZE, 15*l*., for "Butterfly," Hall bred, about 5 years-old; in-milk, calved June 15, 1879; breeder unknown.

GEORGE FERME, Leigham Lodge, Roupell Park, Streatham Hill, Surrey: THIRD PRIZE, 10*l*., for his Ayrshire, about 5 years-old; in-calf; breeder unknown.

WILLIAM BLISS, Chipping Norton, Oxon: the *Reserve Number* to "Juniper Berry," roan Shorthorn, 11 years, 1 month, 5 days-old; in-milk, calved April 14, 1879; bred by W. B. S. Sackville, Drayton House; sire, "George 1st," dam, "Juniper."

SHEEP.

Leicester Shearling Rams.

Hebden Borton, Manor House, Barton-le-Street, Malton, Yorkshire: First Prize, 20*l.*, for his 1 year, 2 months, 1 week-old; bred by himself.

Teasdale Hilton Hutchinson, Manor House, Catterick, Yorkshire: Second Prize, 10*l.*, for his 1 year, 3 months, 2 weeks-old; bred by himself; sire, "Royal Liverpool."

George Turner, jun., Thorpelands, Northampton: Third Prize, 5*l.*, for his 1 year, 3 months, 2 weeks-old; bred by himself.

Teasdale Hilton Hutchinson: the *Reserve Number* to his 1 year, 3 months, 2 weeks-old; bred by himself; sire, "Royal Liverpool."

Leicester Rams of any other age.

Teesdale Hilton Hutchinson, Manor House, Catterick, Yorkshire: First Prize, 20*l.*, for his 2 years, 3 months, 2 weeks-old; bred by himself.

Hebden Borton, Manor House, Barton-le-Street, Malton: Second Prize, 10*l.*, for his "Bachelor," 2 years, 1 month, 3 weeks-old; bred by himself.

George Turner, jun., Thorpelands, Northamptonshire: Third Prize, 5*l.*, for his 2 years, 3 months, 2 weeks-old; bred by himself.

Hebden Borton: the *Reserve Number* to his 2 years, 3 months-old; bred by himself.

Leicesters—Pens of Five Shearling Ewes of the same flock.

The Executors of the late Francis Jordan, of Eastburn, Driffield, Yorkshire: First Prize, 15*l.*, for their 1 year, 3 months-old; bred by themselves.

George Turner, jun., Thorpelands, Northampton: Second Prize, 10*l.*, for his 1 year, 3 months, 2 weeks-old; bred by himself.

Teesdale H. Hutchinson, Manor House, Catterick: Third Prize, 5*l.*, for his 1 year, 3 months, 2 weeks-old; bred by himself; sire, "Royal Liverpool."

William Brown, High Gate House, Holme-on-Spalding-Moor, Yorkshire; the *Reserve Number* to his 1 year, 3 months, 2 weeks-old; bred by himself.

Leicester Ewe Lambs, Pens of Five.

John Green and Son, Low House Farm, Silsden, Leeds: First Prize, 15*l.*, for their 3 months-old; bred by themselves; sire, "Lancaster."

George Turner, Great Bowley, Tiverton, Devon: Second Prize, 10*l.*, for his 3 months, 2 weeks-old; bred by himself: and the *Reserve Number* to his 3 months, 2 weeks-old; bred by himself.

Border Leicester Shearling Rams.

Richard Tweedie, The Forest, Catterick: First Prize, 20*l.*, for his 1 year, 3 months, 2 weeks-old; bred by himself; sire, "Royal James;" sire of

dam, "Lord Lorne:" and SECOND PRIZE, 10*l*., for his 1 year, 3 months, 2 weeks-old; bred by himself; sire, "King James;" sire of dam, "Fitz-James."

JOHN THOMPSON, Baillieknowe, Kelso, N.B.: THIRD PRIZE, 5*l*., for his 1 year, 3 months, 2 weeks-old; bred by himself.

RICHARD TWEEDIE: the *Reserve Number* to his 1 year, 3 months, 2 weeks-old; bred by himself; sire, "Royal James;" sire of dam, "Sir James."

Border Leicester Rams of any other age.

RICHARD TWEEDIE, The Forest, Catterick, "FIRST PRIZE, 20*l*., for "Royal Victor," 2 years, 3 months, 2 weeks-old; bred by himself; sire, "Royal James;" sire of dam, "Sir James:" and SECOND PRIZE, 10*l*., for "Rover," 3 years, 3 months, 2 weeks-old; bred by himself; sire, "King James;" sire of dam, "Sir James."

HENRY BURN, Glororum, Belford, Northumberland: THIRD PRIZE, 5*l*., for his 2 years, 3 months, 1 week-old; bred by himself.

Border Leicester Shearling Ewes, Pens of Five of the same Flock.

RICHARD TWEEDIE, The Forest, Catterick: FIRST PRIZE, 15*l*., for his 1 year, 3 months, 2 weeks-old; bred by himself.

JOHN THOMPSON, Baillieknowe, Kelso, Roxburghshire: SECOND PRIZE, 10*l*., for his 1 year, 3 months, 2 weeks-old; bred by himself.

CHARLES ERNEST HAY, Bradford House, Belford, Northumberland: THIRD PRIZE, 5*l*., for his about 1 year, 3 months-old; bred by himself.

RICHARD TWEEDIE: the *Reserve Number* to his 1 year, 3 months, 2 weeks-old; bred by himself.

Border Leicester Ewe Lambs, Pens of Five.

JOHN THOMPSON, Baillieknowe, Kelso: FIRST PRIZE, 15*l*., for his 3 months, 2 weeks-old; bred by himself.

CHARLES ERNEST HAY, Bradford House, Belford, Northumberland: SECOND PRIZE, 10*l*., for his 3 months, 1 week-old; bred by himself.

RICHARD TWEEDIE, The Forest, Catterick: THIRD PRIZE, 5*l*., for his 3 months, 2 weeks old; bred by himself.

Cotswold Shearling Rams.

THOMAS BROWN, Marham Hall, Downham Market, Norfolk: FIRST PRIZE, 20*l*., for his 1 year, 4 months-old; bred by himself.

THOMAS and STEPHEN GEORGE GILLETT, Kilkenny, Faringdon: SECOND PRIZE, 10*l*., for their 1 year, 4 months, 1 week-old; bred by themselves.

JOHN GILLETT, Oaklands, Charlbury, Oxon: THIRD PRIZE, 5*l*., for his 1 year 5 months, 2 weeks-old; bred by himself.

THOMAS BROWN, Marham Hall: the *Reserve Number* to his 1 year, 4 months-old; bred by himself.

Cotswold Rams of any other age.

THOMAS BROWN, Marham Hall: FIRST PRIZE, 20*l.*, for his 2 years, 4 months-old; bred by himself.

THOMAS AND STEPHEN GEORGE GILLETT, Kilkenny, Faringdon, Oxon: SECOND PRIZE, 10*l.*, for their 2 years, 4 months, 2 weeks-old; bred by themselves.

RUSSELL SWANWICK, the College Farm, Cirencester: THIRD PRIZE, 5*l.*, for his about 2 years, 5 months-old; bred by himself: and *Reserve Number* to his about 2 years, 5 months-old; bred by himself.

Cotswold Shearling Ewes, Pens of Five of the same Flock.

ROBERT JACOBS, Signett Hill, Burford, Oxfordshire: FIRST PRIZE, 15*l.*, for his 1 year, 4 months, 2 weeks-old; bred by himself.

THOMAS and STEPHEN GEORGE GILLETT, Kilkenny: SECOND PRIZE, 10*l.*, for their 1 year, 4 months, 3 weeks-old; bred by themselves.

JOHN GILLETT, Oaklands, Charlbury: THIRD PRIZE, 5*l.*, for his 1 year, 5 months, 2 weeks-old; bred by himself.

RUSSELL SWANWICK, College Farm, Cirencester: the *Reserve Number* to his about 1 year, 5 months-old; bred by himself.

Cotswold Ewe Lambs, Pens of Five.

EDWARD TOMBS, Shilton, Bampton, Oxfordshire: FIRST PRIZE, 15*l.*, for his 5 months, 2 weeks, 2 days-old; bred by himself.

JOHN GILLETT, Oaklands, Charlbury: SECOND PRIZE, 10*l.*, for his 5 months, 2 weeks-old; bred by himself.

ROBERT JACOBS, Signett Hill, Burford: the *Reserve Number* to his 5 months, 2 weeks-old; bred by himself.

Lincoln Shearling Rams.

HENRY SMITH, The Grove, Cropwell Butler, Nottingham: FIRST PRIZE, 20*l.*, for his 1 year, 4 months-old; bred by himself.

JOHN PEARS, Mere, Lincoln: SECOND PRIZE, 10*l.*, for his 1 year, 4 months-old; bred by himself.

ROBERT WRIGHT, Nocton Heath, Lincoln: THIRD PRIZE, 5*l.*, for his 1 year, 3 months, 2 weeks-old; bred by himself.

ARTHUR GARFIT, Scothern, Lincoln: the *Reserve Number* to his about 1 year, 4 months, 1 week-old; bred by himself.

Lincoln Rams of any other age.

HENRY SMITH, The Grove, Cropwell Butler, Nottingham: FIRST PRIZE, 20*l.*, for "Maréchale Bazaine," about 2 years, 2 months-old; bred by the late Mr. W. F. Marshall, Branston, Lincoln: and SECOND PRIZE, 10*l.*, for "Lord Beaconsfield," 5 years, 2 months, 2 weeks-old; bred by Mr. Thomas Mayfield, Dogdyke, Boston.

WILLIAM and HENRY DUDDING, Panton House, Wragby, Lincolnshire: THIRD PRIZE, 5*l.*, for their 2 years, 3 months, 2 weeks-old; bred by themselves.

Robert Charles Catling, Needham Hall: the *Reserve Number* to his about 3 years, 4 months, 3 weeks-old; bred by himself.

Lincoln Shearling Ewes, Pens of Five of the same flock.

John Pears, Mere, Lincoln: First Prize, 15*l.*, for his 1 year, 4 months-old; bred by himself.

Charles Sell, Poplar Farm, Bassingbourne, Royston, Cambridgeshire: Second Prize, 10*l.*, for his 1 year, 3 months, 3 weeks-old; bred by himself.

Robert Charles Catling, Needham Hall, Wisbech, Cambridgeshire: Third Prize, 5*l.*, for his about 1 year, 4 months, 3 weeks-old; bred by himself.

Robert Wright, Nocton Heath, Lincoln: the *Reserve Number* to his 1 year, 3 months, 2 weeks-old; bred by himself.

Lincoln Ewe Lambs, Pens of Five.

William and Henry Dudding, Panton House, Wragby: First Prize, 15*l.*, for their 3 months, 2 weeks-old; bred by themselves.

Charles Sell, Poplar Farm, Bassingbourne, Royston: Second Prize, 10*l.*, for his 4 months-old; bred by himself.

Robert Charles Catling, Needham Hall, Wisbech: the *Reserve Number* to his about 4 months, 3 weeks-old; bred by himself.

Kentish or Romney Marsh Shearling Rams.

John Samuel Strutt Godwin, Hazelwood, Hadlow, Kent: First Prize, 20*l.*, for his 1 year, 3 months, 1 week-old: Second Prize, 10*l.*, for his 1 year, 3 months, 1 week-old: and Third Prize, 5*l.*, for his 1 year, 3 months, 1 week-old; all bred by himself.

Henry Page, Walmer Court, Walmer, Kent: the *Reserve Number* to his 1 year, 3 months, 2 weeks-old, bred by himself.

Kentish or Romney Marsh Rams of any other age.

John Samuel Strutt Godwin, Hazelwood, Hadlow: First Prize, 20*l.*, for his 2 year, 3 months, 1 week-old; bred by himself.

Henry Rigden, Lyminge, Hythe, Kent: Second Prize, 10*l.*, for his 2 years, 2 months, 1 week-old; bred by himself: and Third Prize, 5*l.*, for his 2 years, 2 months, 1 week-old; bred by himself; sire "Guildford."

Thomas Powell, East Lenham, Maidstone, Kent: the *Reserve Number* to his 3 years, 4 months-old; bred by himself.

Kentish or Romney Marsh Shearling Ewes, Pens of Five of the same flock.

John Samuel Strutt Godwin, Hazelwood, Hadlow, Kent: First Prize, 15*l.*, for his 1 year, 3 months, 1 week-old; bred by himself.

Henry Rigden, Lyminge, Hythe, Kent: Second Prize, 10*l.* for his 1 year, 9 months, 1 week-old; bred by himself.

Frederick Neame, jun., Macknade, Faversham, Kent: Third Prize, 5*l.*, for his 1 year, 4 months-old; bred by himself; sire, "Legacy."

Henry Page, Walmer Court, Walmer, Kent: the *Reserve Number* to his 1 year, 3 months, 2 weeks-old; bred by himself.

Kentish or Romney Marsh Ewe Lambs, Pens of Five.

Henry Page, Walmer Court: First Prize, 15*l.*, for his 5 months-old; bred by himself: and Second Prize, 10*l.*, for his 5 months-old; bred by himself.

Bradbury William Tassell, Hode, Patrixbourne, Canterbury: the *Reserve Number* to his 3 months, 3 weeks-old; bred by himself.

Oxfordshire Down Shearling Rams.

John Treadwell, Upper Winchendon, Aylesbury: First Prize, 20*l.*, for his 1 year, 4 months, 2 weeks-old; bred by himself; sire, "The Swell."

Albert Brassey, Heythrop Park, Chipping Norton: Second Prize, 10*l.*, for his 1 year, 4 months, 2 weeks-old; bred by himself: and Third Prize, 5*l.*, for his 1 year, 4 months, 2 weeks-old; bred by himself.

George Adams, Pidnell Farm, Faringdon, Berkshire: the *Reserve Number* to his 1 year, 4 months, 2 weeks-old; bred by himself; sire, "Royal Oxford."

Oxfordshire Down Rams of any other age.

Charles Hobbs, Maisey Hampton, Fairford, Gloucestershire: First Prize, 20*l.*, for his 2 years, 4 months, 2 weeks-old; bred by himself.

John Treadwell, Upper Winchendon: Second Prize, 10*l.*, for "The Swell," about 3 years, 4 months, 2 weeks-old; bred by himself; sire, "Freeland:" and Third Prize, 5*l.*, for "Royal Liverpool," about 3 years, 4 months, 2 weeks-old; bred by himself; sire, "Freeland;" sire of dam, "Gillett."

James and Frederick Howard, Britannia Farms, Bedford: the *Reserve Number* to "Sir Charles," 4 years, 5 months-old; bred by Mr. C. Howard, Biddenham, Bedford.

Oxfordshire Down Shearling Ewes, Pens of Five of the same flock.

John Treadwell, Upper Winchendon: First Prize, 15*l.*, for his about 1 year, 4 months, 2 weeks-old; bred by himself.

George Adams, Pidnell Farm, Faringdon: Second Prize, 10*l.*, for his 1 year, 4 months, 2 weeks-old; bred by himself; sire, "Royal Oxford."

Albert Brassey, Heythrop Park, Chipping Norton: Third Prize, 5*l.*, for his 1 year, 4 months, 2 weeks-old; bred by himself.

George Adams: the *Reserve Number* to his 1 year, 4 months, 2 weeks-old; bred by himself; sire, "Royal Oxford."

Oxfordshire Down Ewe Lambs, Pens of Five.

Albert Brassey, Heythrop Park, Chipping Norton, Oxon: First Prize, 15*l.*, for his 4 months, 2 weeks-old; bred by himself.

William Arkell, jun., Hatherop, Fairford, Gloucestershire: Second Prize, 10*l.*, for his 5 months, 2 weeks-old; bred by himself.

George Street, Maulden, Ampthill, Bedford: Third Prize, 5*l.*, for his about 5 months-old; bred by himself.

James and Frederick Howard, Britannia Farms, Bedford: the *Reserve Number* to their about 5 months, 2 weeks-old; bred by themselves.

Southdown Shearling Rams.

William Rigden, Ashcroft, Kingston-by-Sea, Shoreham, Sussex: First Prize, 20*l.*, for his 1 year, 4 months-old; bred by himself; sire, "Royal Bedford."

Lord Walsingham, Merton Hall, Thetford, Norfolk: Second Prize, 10*l.*, for his 1 year, 4 months-old; bred by himself.

H.R.H. the Prince of Wales, K.G., Sandringham, Norfolk: Third Prize, 5*l.*, for his 1 year, 4 months-old; bred by His Royal Highness.

Lord Walsingham: the *Reserve Number* to his 1 year, 4 months-old; bred by himself.

Southdown Rams of any other age.

Jeremiah James Colman, M.P., Carrow House, Norwich: First Prize, 20*l.*, for his 2 years, 4 months-old; bred by himself.

Henry Humphrey, Ashington Mill, Pulborough, Sussex: Second Prize, 10*l.*, for his 2 years, 3 months, 1 week-old; bred by himself.

H.R.H. the Prince of Wales, K.G., Sandringham: Third Prize, 5*l.*, for his 3 years, 4 months-old; bred by His Royal Highness.

Hugh Gorringe, Kingston-by-Sea, Shoreham, Sussex: the *Reserve Number* to his about 2 years, 4 months, 2 weeks-old; bred by himself.

Southdown Shearling Ewes, Pens of Five of the same flock.

Jeremiah James Colman, M.P., Carrow House, Norwich: First Prize, 15*l.*, for his 1 year, 4 months-old; bred by himself.

John and Alfred Heasman, Angmering, Worthing, Sussex: Second Prize, 10*l.*, for their 1 year, 4 months, 2 weeks-old; bred by themselves.

H.R.H. the Prince of Wales, K.G., Sandringham: Third Prize, 5*l.*, for his 1 year, 4 months-old; bred by His Royal Highness.

Frederick Maulkin Jonas, Chrishall Grange, Saffron Walden, Essex: the *Reserve Number* to his 1 year, 5 months-old; bred by himself.

Southdown Ewe Lambs, Pens of Five.

H.R.H. the Prince of Wales, K.G., Sandringham: First Prize, 15*l.*, for his 3 months, 2 weeks-old; bred by His Royal Highness.

John and Alfred Heasman, Angmering, Worthing, Sussex: Second Prize, 10*l.*, for their 5 months-old; bred by themselves.

Frederick Maulkin Jonas, Chrishall Grange, Saffron Waldon, Essex: Third Prize, 5*l.*, for his 5 months-old; bred by himself.

George Jonas, Ickleton, Great Chesterford, Essex: the *Reserve Number* to his 4 months, 2 weeks-old; bred by himself.

Shropshire Shearling Rams.

GEORGE GRAHAM, The Oaklands, Birmingham: FIRST PRIZE, 20*l.*, for his 1 year, 4 months-old; bred by himself.

THOMAS JAMES MANSELL, Dudmaston Lodge, Bridgnorth, Salop: SECOND PRIZE, 10*l.*, for his 1 year, 4 months-old; bred by himself.

JAMES LENOX NAPER, Loughcrew, Oldcastle, Ireland: THIRD PRIZE, 5*l.*, for his "Sir Grey," 1 year, 3 months, 2 weeks-old; bred by himself; sire, "Sir Gray."

HENRY JAMES SHELDON, Brailes House, Shipton-on-Stour: the *Reserve Number* to his about 1 year, 4 months-old; bred by himself.

Shropshire Rams of any other age.

FRANCIS BACH, Onibury, Craven Arms, Salop: FIRST PRIZE, 20*l.*, for his about 2 years, 3 months, 2 weeks-old; bred by himself.

THOMAS JAMES MANSELL, Dudmaston Lodge: SECOND PRIZE, 10*l.*, for his "Birdlime," 2 years, 4 months, 2 weeks-old; bred by himself; sire, "Double B."

JOHN EDWARD FARMER, of Felton, Ludlow, Salop: THIRD PRIZE, 5*l.*, for his about 2 years, 4 months, 2 weeks-old; bred by himself.

THOMAS NOCK, Sutton Maddock, Shifnal, Salop: the *Reserve Number* to his 1 year, 3 months, 2 weeks-old; bred by himself.

Shropshire Yearling Ewes, Pens of Five of the same flock.

MRS. HARRIET SMITH, New House, Sutton Maddock, Shifnal: FIRST PRIZE, 5*l.*, for her about 1 year, 5 months-old; bred by herself.

GEORGE GRAHAM, The Oaklands, Birmingham: SECOND PRIZE, 10*l.*, for his 1 year, 3 months, 2 weeks-old; bred by himself.

RICHARD THOMAS, The Buildings, Baschurch, Salop, THIRD PRIZE, 5*l.*, for his about 1 year, 4 months-old; bred by himself; sire, "Prince."

HENRY TOWNSHEND, Caldicote Hall, Nuneaton, Warwickshire: the *Reserve Number* to his about 1 year, 3 months, 2 weeks-old; bred by himself.

Shropshire Ewe Lambs, Pens of Five.

THOMAS NOCK, Sutton Maddock, Shifnal, Salop: FIRST PRIZE, 15*l.*, for his 3 months, 2 weeks-old; bred by himself.

Hampshire Shearling Rams.

ALFRED MORRISON, Fonthill House, Tisbury, Wilts: FIRST PRIZE, 20*l.*, for his 1 year, 5 months-old: SECOND PRIZE, 10*l.*, for his 1 year, 5 months, 1 week-old: and THIRD PRIZE, 5*l.*, for his 1 year, 5 months-old; all bred by himself.

FRANK R. MOORE, Littlecott, Pewsey, Wilts: the *Reserve Number* to his about 1 year, 5 months-old; bred by himself.

Hampshire Rams of any other age.

ALFRED MORRISON, Fonthill House: FIRST PRIZE, 20*l.*, for his 2 years, 5 months, 2 weeks-old; bred by himself.

William Parsons, West Stratton, Micheldever, Hants: Second Prize, 10*l.*, for his about 2 years, 5 months old; bred by himself.

Frank R. Moore, Littlecott, Pewsey: Third Prize, 5*l.*, for his 3 years, 4 months, 3 weeks-old; bred by himself.

Henry Lambert, Great Abington, Cambridge: the *Reserve Number* to his about 2 years, 5 months-old; bred by himself.

Hampshire Shearling Ewes, Pens of Five of the same flock.

James Read, Homington, Salisbury, Wilts: First Prize, 15*l.*, for his 1 year, 5 months, 2 weeks-old; bred by himself: and Second Prize, 13*s.*, for his 1 year, 5 months-old; bred by himself.

J. A. and T. Palmer, Nine Mile Waters, Broughton, Stockbridge, Hants: Third Prize, 5*l.*, for their 1 year, 5 months-old; bred by themselves.

Lewis Loyd, Monk's Orchard, Croydon, Surrey: the *Reserve Number* to his 1 year, 4 months, 1 week-old; bred by himself.

Hampshire Ewe Lambs, Pens of Five.

Alfred Morrison, Fonthill House: First Prize, 15*l.*, for his 4 months, 3 weeks-old; bred by himself.

William Parsons, West Stratton, Micheldever, Hampshire: Second Prize, 10*l.*, for his about 5 months-old; bred by himself.

Jonathan Rigg, Wrotham Hill Park, Sevenoaks, Kent: Third Prize, 5*l.*, for his 4 months, 1 week-old; bred by himself.

Cheviot Shearling Rams.

Thomas Elliot, Hindhope, Jedburgh, Roxburghshire: First Prize, 10*l.*, for his 1 year, 2 months, 3 weeks-old; bred by himself: and Second Prize, 5*l.*, for his 1 year, 3 months-old; bred by himself; sire, "Morpeth," sire of dam, "Highland Chief."

John Robson, Byrness, Otterburn, Northumberland: the *Reserve Number* to his 1 year, 3 months-old; bred by himself.

Cheviot Rams of any other age.

Thomas Elliot, Hindhope: First Prize, 10*l.*, for his 3 years, 2 months, 2 weeks-old; bred by himself: sire, "Lauderdale:" and Second Prize, 5*l.*, for his 2 years, 3 months-old; bred by himself.

John Robson, Byrness, Otterburn; the *Reserve Number* to his 3 years, 3 months-old; bred by himself.

Cheviot Shearling Ewes, Pens of Five of the same flock.

Thomas Elliot, Hindhope: First Prize, 10*l.*, for his 1 year, 2 months, 2 weeks-old; bred by himself; sire, "Horney."

John Robson, Byrness; Second Prize, 5*l.*, for his 1 year, 3 months-old; bred by himself.

Black-faced Mountain Shearling Rams.

John Dixon, High Hall, Dent, Yorkshire: First Prize, 10*l.*, for his 1 year, 3 months old; bred by Mr. Ingelby, Bousber, Clapham, Yorkshire.

WILLIAM BEATTIE, Crocknacurmie, Pettigo, Co. Donegal: SECOND PRIZE, 5*l.*, for his 1 year, 2 months, 2 weeks-old; bred by himself.

Black-faced Mountain Rams of any other age.

CHRISTOPHER J. H. TOWER, Weald Hall, Brentwood, Essex: FIRST PRIZE, 10*l.*, for his 4 years, 3 months, 2 weeks-old; bred by himself.

Black-faced Mountain Shearling Ewes, Pens of Five of the same flock.

WILLIAM BEATTIE, Crocknacurmie: FIRST PRIZE, 10*l.*, for his 1 year, 2 months, 1 week-old; bred by himself.

Herdwicks, Shearling Rams.

EDWARD NELSON, Gatesgarth, Cockermouth, Cumberland: FIRST PRIZE, 10*l.*, for "Mountain King," 1 year, 2 months-old; bred by himself: sire, "Yew Tree."

GEORGE BROWNE, Troutbeck, Windermere, Westmoreland: SECOND PRIZE, 5*l.*, for "Duke of Connaught," 1 year, 2 months, 2 weeks-old; bred by himself.

Herdwicks, Rams of any other age.

EDWARD NELSON, Gatesgarth: FIRST PRIZE, 10*l.*, for "Toby Smart," 6 years, 2 months-old; bred by himself: sire, "Gatesgarth Boggle."

GEORGE BROWNE, Troutbeck, Windermere: SECOND PRIZE, 5*l.*, for "Patch," 3 years, 2 months, 2 weeks-old; bred by himself.

Herdwicks, Shearling Ewes, Pens of Five of the same flock.

GEORGE BROWNE, Troutbeck: FIRST PRIZE, 10*l.*, for his 1 year, 2 months, 2 weeks-old; bred by himself.

WILLIAM LEATHES, Lamplugh Hall, Cockermouth, Cumberland: SECOND PRIZE, 5*l.*, for his 1 year, 3 months-old; bred by himself.

Lonks, Shearling Rams.

JOHN GREEN and SON, Low House Farm, Silsden, Leeds: FIRST PRIZE, 10*l.*, for their 1 year, 3 months-old; bred by themselves: sire, "Liverpool Champion."

Lonks, Rams of any other age.

JOHN GREEN and SON: FIRST PRIZE, 10*l.*, for their "Liverpool Champion," 3 years, 3 months-old; bred by themselves.

Lonks, Shearling Ewes, Pens of Five of the same flock.

JOHN GREEN and SON: FIRST PRIZE, 10*l.*, for their 1 year, 3 months-old; bred by themselves: sire, "Liverpool Champion."

Rylands, Shearling Rams.

WILLIAM TAYLOR, Showle Court, Ledbury, Herefordshire: FIRST PRIZE, 10*l.*, for his 1 year, 4 months old; bred by himself.

Rylands, Rams of any other age.

WILLIAM TAYLOR: FIRST PRIZE, 10*l.*, for his 2 years, 4 months-old; bred by himself.

Devon Long-woolled Shearling Rams.

WILLIAM and GEORGE BIRD, Volis, Taunton, Somerset: FIRST PRIZE, 10*l.*, for their about 1 year, 5 months-old; bred by themselves.

SIR J. H. H. AMORY, Bart., M.P., Knightshays Court, Tiverton, Devon: SECOND PRIZE, 5*l.*, for his 1 year, 4 months-old; bred by himself: and the *Reserve Number* to his 1 year, 4 months, 2 weeks-old; bred by himself.

Devon Long-woolled Rams of any other age.

ALFRED BOWERMAN, Capton, Williton, Taunton: FIRST PRIZE, 10*l.*, for his 3 years, 4 months, 2 weeks-old; bred by himself.

RICHARD CORNER, Torweston, Williton, Somerset: SECOND PRIZE, 5*l.*, for his 2 years, 4 months-old; bred by himself.

SIR J. H. H. AMORY, Bart., M.P., Knightshays Court, Tiverton, Devon: the *Reserve Number* to his 2 years, 4 months, 1 week-old; bred by himself.

Devon Long-woolled Shearling Ewes, Pens of Five of the same flock.

SIR J. H. H. AMORY, Bart., M.P., Knightshays Court, Tiverton, Devon: FIRST PRIZE, 10*l.*, for his 1 year, 4 months-old; bred by himself.

JOSEPH NORRIS FRANKLIN, Huxham, Exeter: SECOND PRIZE, 5*l.*, for his about 1 year, 4 months-old; bred by himself.

CHARLES NORRIS, Motion, Exeter: the *Reserve Number* to his 1 year, 4 months-old; bred by himself.

Somerset and Dorset Horned Shearling Rams.

HERBERT FARTHING, Nether Stowey, Bridgwater, Somerset: FIRST PEIZE, 10*l.*, for his 1 year, 3 months, 1 week-old; bred by himself; and SECOND PRIZE, 5*l.*, for his 1 year, 3 months, 1 week-old; bred by himself.

JOHN MAYO, Broadway Farm, Dorchester: the *Reserve Number* to his 1 year, 6 months, 2 weeks-old; bred by himself.

Somerset and Dorset Horned Rams of any other age.

JAMES C. CULVERWELL, Clavelshay, North Petherton, Bridgwater: FIRST PRIZE, 10*l.*, for his 3 years, 6 months-old; bred by himself.

HERBERT FARTHING, Nether Stowey: SECOND PRIZE, 5*l.*, for his 3 years, 5 months, 3 weeks-old; bred by himself.

JOHN MAYO, Broadway Farm: the *Reserve Number* to his 3 years, 6 months, 2 weeks-old; bred by Mr. Thomas Bradford, Look Farm, Abbotsbury.

Somerset and Dorset Horned Shearling Ewes, Pens of Five of the same flock.

EDWARD GAPPER LEGG, Coombe Down, Beaminster, Dorset: FIRST PRIZE, 10*l.*, for his 1 year, 6 months, 2 weeks-old; bred by himself.

JOHN MAYO, Broadway Farm: SECOND PRIZE, 5*l*., for his 1 year, 6 months, 2 weeks-old; bred by himself.

Dartmoor Shearling Rams.

JOHN LENDON BREMRIDGE, Martin Farm, Okehampton, Devon: FIRST PRIZE, 10*l*., for his 1 year, 3 months-old; bred by himself: sire, "Young Model."

JOHN KNAPMAN, East Ash, South Tawton, Okehampton: SECOND PRIZE, 5*l*., for his 1 year, 3 months, 3 weeks-old; bred by himself.

JOHN LENDON BREMRIDGE, Martin Farm: the *Reserve Number* to "Forester," 1 year, 3 months-old; bred by himself: sire, "Model."

Dartmoor Rams of any other age.

ROGER PALMER, Venn Farm, Beaworthy, Exbourne, Devonshire: FIRST PRIZE, 10*l*., for his 5 years, 3 months, 1 week-old; bred by himself.

JAMES DREW, Artiscombe, Tavistock, Devon: SECOND PRIZE, 5*l*., for his 3 years, 4 months-old; bred by himself.

JOHN KNAPMAN, East Ash: the *Reserve Number* to his 3 years, 3 months, 3 weeks-old; bred by Mr. John Jackman, Meadwell, Kelly, Lifton, Devon.

Dartmoor Shearling Ewes, Pens of Five of the same flock.

JAMES DREW, Artiscombe, Tavistock: FIRST PRIZE, 10*l*., for his 1 year, 4 months-old; bred by himself.

ROGER PALMER, Venn Farm, Beaworthy, Exbourne: SECOND PRIZE, 5*l*., for his 1 year, 3 months, 1 week-old; bred by himself.

Exmoor Shearling Rams.

MRS. MARIA LANGDON, Flitton Barton, North Molton, Devon: FIRST PRIZE, 10*l*., for her about 1 year, 3 months, 2 weeks-old; bred by herself.

LORD POLTIMORE, Poltimore Park, Exeter: SECOND PRIZE, 5*l*., for his 1 year, 4 months-old; bred by himself.

Exmoor Rams of any other age.

MRS. MARIA LANGDON, Flitton Barton: FIRST PRIZE, 10*l*., for her about 2 years, 3 months, 2 weeks-old; bred by herself.

LORD POLTIMORE, Poltimore Park: SECOND PRIZE, 5*l*., for his 2 years, 4 months-old; bred by himself.

Exmoor Shearling Ewes, Pens of Five of the same flock.

LORD POLTIMORE, Poltimore Park: FIRST PRIZE, 10*l*., for his 1 year, 4 months-old; bred by himself.

MRS. MARIA LANGDON, Flitton Barton: SECOND PRIZE, 5*l*., for her about 1 year, 3 months, 2 weeks-old; bred by herself.

Welsh Mountain Shearling Rams.

Captain John C. Best, Plas-yn-Vivod, Llangollen, Denbighshire: First Prize, 10*l.*, for his 1 year, 2 months, 1 week-old; bred by himself.

Elias Davies, Backlaw, Conway, Carnarvonshire: Second Prize, 5*l.*, for his 1 year, 3 months, 2 weeks-old; bred by himself.

Welsh Mountain Rams of any other age.

Mrs. Jane Griffith, Merchlyn, Conway, Carnarvonshire: First Prize, 10*l.*, for "Bismarck," 5 years, 3 months-old: bred by Mr. William Roberts, Llwydfan, Conway: and Second Prize, 5*l.*, for "Will," 2 years, 3 months-old; bred by herself: sire, "Bismarck."

Welsh Mountain Shearling Ewes, Pens of Five of the same flock.

Mrs. Jane Griffith: First Prize, 10*l.*, for her 1 year, 3 months-old; bred by herself: sire, "Bismarck."

Edward Thomas, Penisarwaen, Trefnant, Rhyl, Flints: Second Prize, 5*l.*, for his 1 year, 3 months-old; bred by himself.

Roscommon Rams.

Benjamin Hannan, Riverstown, Killucan, Westmeath, Ireland: First Prize, 10*l.*, for "Paddy go Easy," 2 years, 3 months, 4 weeks-old; bred by himself: sire, "Tichborne."

Patrick Merlehan, Kilmaglish, Mullingar, Westmeath: Second Prize, 5*l.*, for "Paddy Whack," 2 years, 3 months, 2 weeks-old; bred by himself: sire, "Connaught Ranger," sire of dam, "Faugh-a-Ballagh."

Benjamin Hannan: the *Reserve Number* to "Rory," 3 years, 4 months-old; bred by himself: sire, "Connaught Ranger."

Roscommon Shearling Ewes, Pens of Five of the same flock.

Benjamin Hannan, Riverstown: First Prize, 10*l.*, for his 1 year, 3 months, 2-weeks-old; bred by himself: sire, "Connaught Ranger."

Patrick Merlehan, Kilmaglish: Second Prize, 5*l.*, for his about 1 year, 3 months-old; bred by himself: sire, "Paddy Whack."

GOATS.

Short-haired British—Males.

Miss Frances A. C. Cresswell, Windlesham, Bagshot, Surrey: First Prize, 5*l.*, for "Prince Charlie," 3 years, 6 months, 3 weeks-old; bred by herself.

Professor James Beart Simmonds, College House, Great College Street, London: Second Prize, 3*l.*, for "Bouncing Billy," 1 year, 2 months-old; breeder unknown.

Short-haired British—Females.

FREDERICK AUGUSTUS CRISP, 338, Walworth Road, Walworth, Surrey: FIRST PRIZE, 5*l.*, for "Nan," in-milk and in-kid, about 8 years-old; breeder unknown.

PROFESSOR JAMES BEART SIMMONDS: SECOND PRIZE, 3*l.*, for "Lady Camden," in-milk, about 4 years-old; breeder unknown.

BENTINCK CANNEY, Montrose Villa, George Road, Lewisham, Kent: the *Reserve Number* to "Pet," in-kid, under 4 years-old.

Long-haired British—Males.

PROFESSOR JOHN WORTLEY AXE, The Wilderness, Pinner, Watford, Middlesex: FIRST PRIZE, 5*l.*, for "Pinner Duke;" age and breeder unknown.

EDWARD THADDEUS CROOKENDEN, 305, Deptford Lower Road, Deptford, Kent: SECOND PRIZE, 3*l.*, for his 3 years, 1 month, 2 weeks-old; breeder unknown.

Long-haired British—Females.

MISS AGNES JACOMB, The Mount, Pinner, Watford, Middlesex: FIRST PRIZE, 5*l.*, for "Nina," in-milk, 8 years, 4 months-old; breeder unknown.

CHARLES DAYMON, 5, Glasshouse Yard, Aldersgate Street, London: SECOND PRIZE, 3*l.*, for "Nan," in-milk, 4 years, 8 months-old; breeder unknown.

PIGS.

Large White Breed—Boars, above Six Months and not exceeding Twelve Months old.

JAMES and FREDERICK HOWARD, Britannia Farms, Bedford: FIRST PRIZE, 5*l.*, for their 7 months, 2 weeks, 1 day-old; bred by themselves; sire, Liverpool;" dam, "Silverhair," by "King."

THE EARL OF ELLESMERE, Worsley Hall, Manchester: SECOND PRIZE, 5*l.*, for "Samson 5th," 11 months, 3 weeks, 3 days-old; bred by himself; sire, "Samson 2nd;" dam, by "Pride of Idle."

CHARLES ELMHIRST DUCKERING, Northorpe, Kirton Lindsey, Lincolnshire: the *Reserve Number* to "Glüell," 10 months, 4 weeks, 1 day-old; bred by himself; sire, "Cultivator 16th."

Large White Breed—Boars, above Twelve Months old.

THE EARL OF ELLESMERE, Worsley Hall, Manchester: FIRST PRIZE, 10*l.*, for "Samson 2nd," 4 years, 6 months-old; bred by Mr. M. Walker, Chaddesden, Derby; sire, "Samson;" dam by "Victor 2nd:" and SECOND PRIZE, 3*l.*, for "Samson 4th," 2 years, 6 months-old; bred by himself; sire, "Samson;" dam, by "Yorkshire Lad."

CHARLES ELMHIRST DUCKERING, Northorpe, Kirton Lindsey: the *Reserve Number* to "Cultivator 16th," 1 year, 11 months-old; bred by himself; sire, "Cultivator 13th."

Large White Breed—Pens of three Breeding Sow Pigs of the same Litter, above Three and not exceeding Twelve Months old.

ALFRED CROWTHER, Star Inn, Bridge Street, Bury, Lancashire: FIRST PRIZE, 10*l.*, for his 5 months, 3 weeks-old; bred by himself; sire, "Samson;" dam, "Luce."

ROBERT TOMMAS, Winson Green, Birmingham: SECOND PRIZE, 5*l.*, for his 5 months, 6 days-old; bred by himself; sire, "Emperor;" dam, "Tigress," by "Esau:" and the *Reserve Number* to his 5 months, 2 weeks, 2 days-old; bred by himself; sire, "Samson;" dam, "Giantess," by "Jerry."

Large White Breed—Breeding Sows.

THE EARL OF ELLESMERE, Worsley Hall, Manchester: FIRST PRIZE, 10*l.*, for "Empress," 2 years, 3 months, 1 day-old; bred by himself; sire "Samson;" dam by "Old Nonsuch": and SECOND PRIZE, 5*l.*, for "Queen of Sheba," 4 years, 6 months-old; bred by Mr. M. Walker, Chaddesden, Derby; sire, "Samson;" dam by "Victor 2nd."

PETER EDEN, Cross Lane, Salford, Manchester: the *Reserve Number* to "Dewdrop," 2 years, 7 months, 2 days-old; bred by himself; sire, "Champion;" dam, "Lillium," by "Kingcraft."

Small White Breed—Boars, above One and not exceeding Twelve Months old.

THE EARL OF ELLESMERE, Worsley Hall, Manchester: FIRST PRIZE, 10*l.*, for "Prince," 11 months, 2 weeks, 3 days-old; bred by Mr. Blakey, Otley, Yorks; sire, "Jerry;" dam, "Footstep."

LORD MORETON, Tortworth Court, Falfield, Gloucestershire: SECOND PRIZE, 5*l.*, for "Pearl's Son," 10 months, 3 weeks-old; bred by himself; sire, "Young XL;" dam, "Pearl," by "Barrister."

SANDERS SPENCER, Holywell, St. Ives, Hunts: the *Reserve Number* to "Pompous," 10 months, 4 weeks-old; bred by himself; sire, "Puritan;" dam, "Sister to Pride of Oxford," by "Tom Thumb."

Small White Breed—Boars, above Twelve Months old.

SANDERS SPENCER, Holywell, St. Ives: FIRST PRIZE, 10*l.*, for "Esau," 1 year, 2 months, 3 weeks, 1 day-old; bred by himself; sire, "Puritan;" dam, "Oh Don't," by "The Czar."

THE EARL OF ELLESMERE, Worsley Hall, Manchester: SECOND PRIZE, 5*l.*, for "The Swell," 1 year, 10 months, 3 weeks-old; bred by himself; sire, "XL;" dam, "Nelly Farren."

CHARLES ELMHIRST DUCKERING, Northorpe, Kirton Lindsey, Lincolnshire: the *Reserve Number* to "Osman," 1 year, 9 months-old; bred by himself.

Small White Breed—Pens of Three Breeding Sow Pigs of the same Litter, above Three and not exceeding Six Months old.

THE EARL OF ELLESMERE, Worsley Hall, Manchester: FIRST PRIZE, 10*l.*, for his 3 months, 3 weeks, 5 days-old; bred by himself; sire, "King of the Peacocks;" dam, "British Queen:" and SECOND PRIZE, 5*l.*, for his

3 months, 3 weeks, 3 days-old; bred by himself; sire, "King of the Peacocks;" dam, "Gem."

Sanders Spencer, Holywell, St. Ives: the *Reserve Number*, to his 4 months, 1 week, 3 days-old; bred by himself; sire, "Puritan;" dam, "Opossum," by "Tom Thumb."

Small White Breed—Breeding Sows.

Lord Moreton, Tortworth Court, Falfield: First Prize, 10*l*., for his 1 year, 3 months, 3 days-old, in-pig; bred by himself; sire, "Young XL."

The Earl of Ellesmere, Worsley Hall, Manchester: Second Prize, 5*l*., for "Duchess," 2 years, 3 months-old; bred by himself; sire, "The Dutchman;" dam by "XL."

Alfred Crowther, Star Inn, Bridge Street, Bury, Lancashire: the *Reserve Number* to "Beauty," 2 years, 4 months, 2 weeks, 3 days-old; bred by himself; sire, "Bill;" dam, "Sister to Duchess."

Small Black Breed—Boars, above Six and not exceeding Twelve Months old.

Matthew Walker, Chaddesden, Derby: First Prize, 10*l*., for "Little John," 9 months, 1 week, 5 days-old; bred by Mr. Sexton, Wherstead Hall, Ipswich; sire, "Adventurer's Son;" dam, "Admirable," by "Prodigal."

The Duke of Hamilton and Brandon, Easton Park, Wickham Market, Suffolk:" Second Prize, 5*l*., for "Young Doncaster," 11 months, 3 weeks, 5 days-old; bred by himself; sire, "Doncaster;" dam, "Favourite."

William Wheeler, Long Compton, Shipston-on-Stour, Worcestershire: the *Reserve Number*, to his 6 months, 1 day-old; bred by himself.

Small Black Breed—Boars, above Twelve Months old.

The Rev. William Hooper, Chilfrome Rectory, Dorchester: First Prize, 10*l*., for "Lord Beaconsfield," 1 year, 1 month, 2 weeks, 4 days-old; bred by himself; sire, "Sultan."

Charles Elmhirst Duckering, Northorpe, Kirton Lindsey, Lincolnshire: Second Prize, 5*l*., for his 1 year, 1 month, 1 week-old; bred by Mr. G. M. Sexton, Wherstead Hall, Ipswich.

Matthew Walker, Chaddesden, Derby: the *Reserve Number* to "Childeric," 1 year, 10 months, 3 weeks-old; bred by Mr. Sexton, Wherstead Hall, Ipswich; sire, "Prince Charlie;" sire of dam, "Blair Athol."

Small Black Breed—Breeding Sows.

William Wheeler, Long Compton, Shipston-on-Stour: First Prize, 10*l*., for his 1 year, 9 months-old; bred by himself: and Second Prize, 5*l*., for his 1 year, 7 months, 1 day-old; bred by himself.

Matthew Walker, Chaddesden, Derby: the *Reserve Number* to "Paris," 2 years, 2 months-old; bred by Mr. Sexton, Wherstead Hall, Ipswich; sire, "Prodigal;" dam, "Victoria," by "Blair Athol."

Berkshires—Boars, above Six Months and not exceeding Twelve Months old.

ARTHUR STEWART, Saint Bridge Farm, Gloucester: FIRST PRIZE, 10*l.*, for his 11 months, 1 week, 1 day-old; bred by himself; sire, "Prodigal:" and SECOND PRIZE, 5*l.*, for his 11 months, 1 week, 1 day-old; bred by himself; sire, "Prodigal."

EDWARD TOMBS, Shilton, Bampton, Oxfordshire: the *Reserve Number* to "Aylesbury," 9 months, 2 weeks-old; bred by himself; sire, "Timothy;" dam, "Lady Mallard," by "Baron Suthrope."

Berkshires—Boars, above Twelve Months old.

HEBER HUMFREY, Kingstone Farm, Shrivenham, Berks: FIRST PRIZE, 10*l.*, for "Bingley 1st," 2 years, 2 weeks, 3 days-old; bred by himself; sire, "Hillsmere;" dam, "May Rugby," by "Maybourne."

LORD CHESHAM, Latimer, Chesham, Bucks: SECOND PRIZE, 5*l.*, for his 3 years, 2 months-old; bred by Mr. Heber Humfrey, Kingstone, Shrivenham, Berks.

RUSSELL SWANWICK, College Farm, Cirencester, Gloucestershire: the *Reserve Number* to "Emulation," 2 years, 1 month, 1 week, 3 days-old; bred by himself; sire, "May Breeze."

Berkshires—Pens of Three Breeding Sow Pigs of the same Litter, above Three and not exceeding Six Months old.

WILLIAM HENRY WALKER, Shenfield Hall, Brentwood, Essex: FIRST PRIZE, 10*l.*, for his 4 months, 2 days-old; bred by himself; sire, "Tartar," dam, "Rosette 2nd."

LORD CHESHAM, Latimer, Chesham: SECOND PRIZE, 5*l.*, for his 5 months, 2 weeks, 2 days-old; bred by himself.

ARTHUR STEWART, Saint Bridge Farm, Gloucester: the *Reserve Number* to his 4 months, 2 weeks, 4 days-old; bred by himself; sire, "Sir Sniper;" "Lady Berkeley."

Berkshires—Breeding Sows.

HEBER HUMFREY, Kingstone Farm, Shrivenham, Berks: FIRST PRIZE, 10*l.*, for "Donna Louise," 3 years, 1 month, 3 weeks, 6 days-old; in-pig; bred by Mr. D. Ashcroft, Blackamoor's Head Hotel, Preston, Lancashire; sire, "Sir Roger;" dam, "Belladonna," by "Kingcraft."

RICHARD FOWLER, Broughton Farm, Aylesbury: SECOND PRIZE, 5*l.*, for "Princess Royal 2nd," 3 years, 1 month-old; in-pig; bred by himself.

WILLIAM HENRY WALKER, Shenfield Hall, Brentwood, Essex: the *Reserve Number* to "Miss Colchester," 2 years, 10 months-old; in-pig; bred by Mr. G. Griggs, Queensberry Lodge, Elstree, Herts; sire, "Little John;" dam, "Lady Colchester."

Other Breeds—Boars, above Six Months and not exceeding Twelve Months old.

JOHN and JOSEPH NUTTALL, 13, Long Field, Haywood, Lancashire: FIRST PRIZE, 10*l.*, for "Young Gladstone," white, 10 months, 4 weeks-old; bred by Mr. Benjamin Calvert, Haywood Lane; sire, "Tichborne;" dam. "Lucy 3rd," by "Sir Albert."

ROBERT TOMMAS, Winson Green, Birmingham: SECOND PRIZE, 5*l.*, for "Punch," white, 11 months, 1 week, 3 days-old; bred by himself; sire, "Esau;" dam, "Eva," by "Duke of York."

THE EARL OF ELLESMERE, Worsley Hall, Manchester: the *Reserve Number* to "Topsman," white, 11 months, 3 weeks, 3 days-old; bred by himself; sire, "Lancashire Lad;" dam by "Pretender."

Other Breeds—Boars above Twelve Months old.

JOHN and JOSEPH NUTTALL, 13, Long Field, Haywood, Lancashire: FIRST PRIZE, 10*l.*, for "Tichborne," white, 3 years, 8 months-old; bred by themselves; sire, "Sir Albert;" dam, "Lucy 1st," by "Hero."

THE EARL OF ELLESMERE, Worsley Hall, Manchester: SECOND PRIZE, 5*l.*, for "King Duncan," white, 2 years, 4 months-old; bred by himself; sire, "Scottish Chief;" dam by "Duke of Lancaster."

PETER EDEN, Cross Lane, Salford, Manchester: the *Reserve Number* to "Star of the East," white with spot, 3 years, 10 months-old; bred by himself; sire, "King;" dam, "Similise," by "Major."

Other Breeds—Pens of Three Breeding Sow Pigs of the same Litter, above Three and not exceeding Six Months old.

LIEUT.-COL. B. G. DAVIES COOKE, Colomendy, Mold, Flints: FIRST PRIZE, 10*l.*, for his white, 5 months, 2 weeks-old; bred by himself; sire, "Marquis 2nd;" dam, "Chignon," by "The Earl."

SANDERS SPENCER, Holywell, St. Ives, Hunts: SECOND PRIZE, 10*l.*, for his white, 4 months, 3 weeks, 6 days-old; bred by himself; sire, "Samson 3rd;" dam, "Oh Dear," by "Tom Thumb:" and the *Reserve Number* to his white, 4 months-old; bred by himself; sire, "Puritan;" dam, "Giantess."

Other Breeds—Breeding Sows.

THE EARL OF ELLESMERE, Worsley Hall: FIRST PRIZE, 5*l.*, for "Gipsy Queen," white, 2 years-old; bred by himself; sire, "King Lear;" dam by "Duke of Lancaster:" and SECOND PRIZE, 5*l.*, for "Lady Worsley," white, 2 years, 2 months, 2 days-old; bred by himself; sire, "Peter the Great;" dam, "Queen Bee."

PETER EDEN, Cross Lane, Salford, Manchester: the *Reserve Number* to "Sunset;" white, 3 years, 5 months, 3 days-old; bred by himself; sire, "Prince 3rd;" dam, "Sunshine," by "Major."

FOREIGN STOCK.

HORSES.*

Percheron and Boulonnais Stallions, Three Years old and upwards.

PIERRE LOUIS MODESSE-BERQUET, Any-Martin-Rieux: FIRST PRIZE, 50*l.*, for "Turenne," grey, 8 years-old; bred by M. Briet-Dufrin.

THE DUKE OF WESTMINSTER, Eaton, Chester: SECOND PRIZE, 20*l.*, for "Brilliant," aged.

PIERRE LOUIS MODESSE-BERQUET, Any-Martin-Rieux, Canton d'Aubenton, Aisne, France: THIRD PRIZE, 10*l.*, for "Prince," grey, 7 years-old; bred by M. Briet-Dufrin.

EDMOND DE LA VILLE, Bretteville-sur-Odon, Calvados, France: the *Reserve Number* to "Hercules," grey, 4 years-old; bred by M. Leroy.

Percheron or Boulonnais Mares.

WILLIAM PERKINS WARNER, Welsh Harp, Hendon, Middlesex: FIRST PRIZE, 30*l.*, for "Milly," grey, aged; breeder unknown: SECOND PRIZE, 20*l.*, for "Nora," grey, 7 years-old; breeder unknown.

Norman and Anglo-Norman Stallions, Three Years old.

EDMOND DE LA VILLE, Bretteville-sur-Odon: FIRST PRIZE, 50*l.*, for "Themistocle," dark bay, 4 years-old; bred by M. Joseph Digard; sire, "Hippocrate;" dam, "Lapin," by "Harmonieux:" SECOND PRIZE, 20*l.*, for "Taciturne," bay, 4 years-old; bred by M. Catteloup; sire, "Lucullus;" dam, "Charlotte," by "Feu de joie; THIRD PRIZE, 10*l.*, for "Talion," bay, 4 years-old; bred by M. le Mettais; sire, unknown; dam, "Nouvette," by "Lothair:" and *Reserve Number* to "Utile," bay, 3 years-old; bred by M. Veuve Lecostey; sire, "Nagel;" dam, "Cocotte," by "Harmonieux."

Norman and Anglo-Norman Mares.

CERAN MAILLARD, Ste. Marie-du-Mont, Manche, France: FIRST PRIZE, 30*l.*, for "Cendrillon," chestnut, 7 years-old, in-foal to "Lavater;" bred by himself; sire, "Heir of Line;" dam, "Corsaire," by "Corsair."

Flemish Stallions.

REMI VANDERSCHUEREN, Volzeele, Belgium: FIRST PRIZE, 50*l.*, for "Brilliant," chestnut, 8 years-old; bred by the Baron Adelmar De Heenhould; sire, "Orange;" dam, "Louise."

Flemish Mares.

PAUL TIBERGHIEN, Senesse, Hainault, Belgium: THIRD PRIZE, 10*l.*, for "Altesse," bay, 6 years-old; in-foal to "The Duke of Waterloo;" bred by himself and Mr. Van Neck.

Other Foreign Draught Horses—Stallions, Three Years old and upwards.

PAUL TIBERGHIEN, Senesse, Hainault, Belgium: FIRST PRIZE, 50*l.*, for "Bayard 2nd," roan, 3 years-old; bred by himself; sire, "Bayard;" dam, "Cocotte," by "Marie."

LAMBERT EDOUARD JOUREZ, Braine l'Allend, Belgium: SECOND PRIZE, 20*l.*, for "Néron," bay, 3 years-old; bred by M. Theys; sire, "Colin;" dam, "Mouche," by "Richermont."

PAUL TIBERGHIEN, Senesse, Hainault, Belgium: THIRD PRIZE, 10*l.*, for "The Duke of Waterloo," chestnut, 4 years-old; bred by M. Goes; sire, "Ghost;" dam, "Fanny."

Other Foreign Draught Horses—Mares.

PAUL TIBERGHIEN, Senesse, Hainault, Belgium: FIRST PRIZE, 30*l.*, for "Sultana," grey, 9 years-old, in-foal to "The Duke of Waterloo:" SECOND PRIZE, 20*l.*, for "Louisa," roan, 3 years, 2 months-old, in-foal to "The Duke of Waterloo:" THIRD PRIZE, 10*l.*, for "Juliette," roan, 3 years, 2 months-old, in-foal to "The Duke of Waterloo:" and the *Reserve Number* to "Belle Alliance," roan, 5 years-old, in-foal to "The Duke of Waterloo;" all bred by himself.

Riding and Carriage-Horses—Stallions, Three Years old and upwards.

EDMOND DE LA VILLE, Bretteville-sur-Odon: FIRST PRIZE, 50*l.*, for "Ukase," bay, 3 years-old; bred by M. Charrer; sire, "Marignan;" dam by "Julien:" SECOND PRIZE, 20*l.*, for "Umbra," bay, 3 years-old; bred by M. Lambert Boissel; sire, "Phare;" dam, "Bijou," by "Beaumanoir: THIRD PRIZE, 10*l.*, for "Tournoi," 4 years-old; bred by M. Francis Martin; sire, "Kapirat;" dam, "The Roué," by "John Bull:" and the *Reserve Number* to "Usurpateur," bay, 3 years-old; bred by M. Decrivain; sire, "Schamyl;" dam, "Nathalie," by "Tamerlan."

Riding and Carriage-Horses—Mares.

LANDWIRTHSCHAFTLICHER-CENTRAL-VEREIN FÜR LITTAUEN UND MASUREN, of Instersburg, Germany: FIRST PRIZE, 30*l.*, for "Frieda," brown, 5 years-old; bred by Mr. Meyer; sire, "Elimar:" SECOND PRIZE, 20*l.*, for "Gudrun," brown, 3 years-old; bred by Mr. Meyer; sire, "Engelhardt:" THIRD PRIZE, 10*l.*, for "Goldelse," brown, 7 years-old; bred by Mr. Kowatewsky: and the *Reserve Number* to "Liese," brown, 4 years-old; bred by Mr. Shumalong; sire, "Dudnek."

CATTLE.*

Shorthorn Bulls, above Two Years old.

JOHANNES INGWERSEN, Hegnet, Skive, Denmark: FIRST PRIZE, 25*l.*,† for his red, 2 years, 6 months-old; bred by himself.

Norman Bulls, above Two Years old.

HECTOR LE SUEUR, Port-en-Bessin, Calvados, France: FIRST PRIZE, 25*l.*, for "Robert," white and red, 3 years, 1 month, 4 weeks, 1 day-old; bred by M. Lepannier, Gueron, near Bayeux.

† In this class the Prize was given by the Shorthorn Society of Great Britain and Ireland.

CÉRAN MAILLARD, Ste. Marie-du-Mont, Manche, France: SECOND PRIZE, 15*l.*, for his 2 months, 15 days-old; bred by himself.

Norman Bulls, not exceeding Two Years old.

HECTOR LE SEUER, Port-en-Bessin, Calvados, France: FIRST PRIZE, 15*l.*, for "Crispin," dun and white, 1 year, 7 months, 1 week, 2 days-old; bred by M. Georges Lereverend, Sour, Calvados.

CÉRAN MAILLARD, Ste. Marie-du-Mont, Manche, France: SECOND PRIZE, 10*l.*, for his 1 year, 8 months, 4 days-old; bred by himself.

Norman Cows, above Three Years old.

CÉRAN MAILLARD, Ste. Marie-du-Mont, France: FIRST PRIZE, 20*l.*, for his 4 years, 1 month, 20 days-old; bred by himself.

HECTOR LE SUEUR, Port-en-Bessin, SECOND PRIZE, 10*l.*, for "La Juliette," brown and white, 4 years, 1 week, 4 days-old; bred by M. Langlois: THIRD PRIZE, 5*l.*, for "Bichette," 4 years, 6 months, 13 days-old; bred by M. Lepaisant: and the *Reserve Number* to his 4 years, 10 months, 5 days-old; bred by M. Felix Lefèvre.

Norman Heifers, not exceeding Three Years old.

CÉRAN MAILLARD, Ste. Marie-du-Mont, Manche, France: FIRST PRIZE, 15*l.*, for his 1 year, 10 months-old; bred by himself.

HECTOR LE SUEUR, Port-en-Bessin: SECOND PRIZE, 10*l.*, for "La Barbette," black and white, 2 years, 9 months, 2 days-old; bred by M. Félix Lamy, Port-en-Bessin, Calvados: and THIRD PRIZE, 5*l.*, for "Blondine," dun and white, 2 years, 3 months, 3 weeks, 3 days-old; bred by M. Louis Ditourel, Coleville-sur-Mer, Calvados.

CÉRAN MAILLARD, Ste. Marie-du-Mont: the *Reserve Number* to his 2 years, 6 months, 4 days-old; bred by himself.

Breton Bulls, above Two Years old.

ALBERT DIXON, Wingfield, Windsor, Berks: FIRST PRIZE, 25*l.*, for "Jobie," black and white, 2 years, 1 month-old; bred by M. Lecart, Châteauneuf, du Faud, Finistère, France.

Breton Bull, not exceeding Two Years old.

H. B. SPURGIN, Northampton: FIRST PRIZE, 15*l.*, for "Little John," black and white, 1 year, 5 months, 2 weeks-old; bred by himself.

Breton Cows, above Three Years old.

H. B. SPURGIN, Northampton: FIRST PRIZE, 20*l.*, for "Lady Beatrice," 5 years, 6 months-old.

ALBERT DIXON, Winkfield: SECOND PRIZE, 10*l.*, for "Lisette," 3 years, 4 months-old; breeder unknown: and THIRD PRIZE, 5*l.*, for "Jeanette," 3 years, 7 months-old; breeder unknown.

A. R. LADWICK, Warden, Herne Hill, Surrey: the *Reserve Number* to "Polly," 3 years, 9 months-old.

Breton Heifers, exceeding Two Years old.

H. B. Spurgin, Northampton: First Prize, 15*l.*, for "Lady Jane," 2 years, 6 months-old: and Second Prize, 10*l.*, for "Lady Nancy," 1 year, 6 months-old.

Dutch and Flemish Bulls, above Two Years old.

Teunis Klay, Mydrecht, Utrecht, Holland: First Prize, 25*l.*, for "Prins," black pied, 2 years, 3 months, 2 weeks, 5 days-old; bred by himself; sire, "Symen, S 1," No. 23 (of the Dutch Herd Book).

Angeln Bulls, above Two Years old.

Rudolph Bay Blœdel, Wilhelmsberg, Assens, Fune, Denmark: First Prize, 25*l.*, for "Garibaldi II.," red, 5 years, 7 months, 3 weeks-old; bred by himself.

Henry Alfred Exholm Smidt, Nyböltegaard, Ringe, Fune, Denmark: Second Prize, 15*l.*, for "Ourupgaard," red, 6 years, 1 month, 3 weeks, 3 days-old; bred by Mr. Edward Tesdorpf, Ourupgaard.

Edward Tesdorpf, Ourupgaard, Nykjöbing, Falster, Denmark: Third Prize, 5*l.*, for "No. 1," red, 4 years, 6 months-old; bred by himself; sire, "No. 127;" dam, "No. 121."

Angeln Bulls, not exceeding Two Years old.

Rudolph Bay Blœdel, Wilhelmsberg, Assens, Fune, Denmark: First Prize, 15*l.*, for "Wilhelmsborg," red, 1 year, 8 months, 4 days-old; bred by himself.

Angeln Cows, above Three Years old.

Henry Alfred Oxholm Smidt, Nyböltegaard, Ringe, Fune, Denmark: First Prize, 20*l.*, for "Pussy," red, 12 years-old; bred by a peasant, Nybötte, Ringe, Fune.

Fredirrek Langkilde, Kjörup, Odense, Fune, Denmark: Second Prize, 10*l.*, for "Dagmar," red, 8 years-old; bred in Slesvig.

Edward Tesdorpf, Ourupgaard: Third Prize, 5*l.*, for "No. 36," red, 5 years-old; bred by himself.

Angeln Heifers, not exceeding Three Years old.

Mads Clausen, Mairedal, Odense, Fune, Denmark: First Prize, 15*l.* for his red, 1 year, 7 months, 2 weeks, 5 days-old; bred by himself.

Jens Hansen, Holes, Odonse, Fune, Denmark: Second Prize, 10*l.*, for "Esholm No. 2," red, 2 years, 1 month, 2 weeks, 2 days-old; bred by himself.

Edward Tesdorpf, Ourupgaard, Nykjöbing, Falster: Third Prize, 5*l.*, for his red, 2 years, 3 months-old; bred by himself: and the *Reserve Number* to his red, 2 years, 3 months-old; bred by himself.

Jutland Bulls, above Twelve Months old.

Johannes Ingwersen, Hegnet, Skive, Jutland, Denmark: First Prize, 25*l.* for his dun and white, 4 years, 3 months-old; breeder unknown.

A. W. KNUTH, Mariebo, Isle of Lolland, Denmark: SECOND PRIZE, 15*l.*, for "No. 1," black and white, 5 years, 3 months, 4 days-old; bred by himself.

JOHANNES INGWERSEN, Hegnet: THIRD PRIZE, 5*l.*, for his black and white, 5 years-old; bred by M. Gjidde, Glenstrop, Nykjöbing.

PEDER WESTERGAARD, Fjerritsler, Jutland, Denmark: the *Reserve Number* to "Odin," greyish brown, 5 years, 2 months, 3 days-old; bred by Mr. Niels Pedersen, Malle, near Thisted.

Jutland Bulls, not exceeding Two Years old.

ANDERS FREDERIK, Lündsgaard, Langersgaard, Skive, Jutland, Denmark: FIRST PRIZE, 15*l.*, for his dun and white, 1 year, 10 months-old; bred by Mr. Voitmann, Frydsbrönd, Nykjöbing.

Jutland Cows, above Three Years old.

P. C. JENSEN, Sundby, Nykjöbing: FIRST PRIZE, 20*l.*, for his dun and white, 4 years, 6 months-old; bred by himself.

JOHANNES INGWERSEN, Hegnet, Skive, Jutland, Denmark: SECOND PRIZE, 10*l.*, for his dun and white, 7 years, 9 months-old; bred by himself.

CHRESTEN JENSEN, Lundgaard, Viborg: THIRD PRIZE, 5*l.*, for his black and white, 7 years-old; bred by Niels Mehlsen, Nykjöbing, Morse, Jutland.

JOHANNES INGWERSEN, Hegnet: the *Reserve Number* to his black and white, 6 years-old.

Jutland Heifers, not exceeding Three Years old.

A. W. KNUTH, Mariebo, Isle of Lolland, Denmark: FIRST PRIZE, 15*l.*, for "Heifer No. 10," black and white, 2 years, 3 months, 4 weeks, 1 day-old; bred by himself.

CHRESTEN JENSEN, Lundgaard, Viborg: SECOND PRIZE, 10*l.*, for his dun and white, 2 years, 9 months-old; bred by Mr. Voitman, Frydsbrond, Nykjöbing.

ANDERS FREDERIK, Lündsgaard, Langersgaard, Skive, Jutland, Denmark: THIRD PRIZE, 5*l.*, for his black and white, 2 years, 10 months, 1 week-old; bred by Mr. Hans Jensen, Bysted, near Skive: and the *Reserve Number* to his black and white, 2 years, 9 months old; bred by Mr. Chr. Mortensens, Frustrup, Nygaard, near Skive.

SHEEP.*

French Merino Rams.

MARIN BAILLEAU, Illiers, Eure-et-Loir: FIRST PRIZE, 15*l.*, for his 2 years, 10 months old; bred by himself.

MANCEAU GUERIN, Challet, près Chartres: SECOND PRIZE, 10*l.*, for "No. 83 GM," 1 year, 6 months-old; bred by himself.

MARIN BAILLEAU, Illiers: the *Reserve Number* to his 2 years 10 months-old; bred by himself.

French Merino Ewes or Gimmers, Pens of Five.

MARIN RENÉ BAILLEAU, Illiers, Eure-et-Loir, France: FIRST PRIZE, 15*l.*, for his 1 year, 6 months-old; bred by himself.

MANCEAU GUERIN, Challet, près Chartres, France: SECOND PRIZE, 10*l.*, for his 2 years, 6 months, to 3 years, 6 months-old; bred by himself: and the *Reserve Number* to his 1 year, 6 months-old; bred by himself.

Pure Long Woolled (not Merino) Rams.

CÉRAN MAILLARD, Ste. Marie-du-Mont: FIRST PRIZE, 15*l.*, for his 2 years, 2 months-old; bred by himself.

Pure Long Woolled (not Merino) Ewes or Gimmers, Pens of Five.

CÉRAN MAILLARD, Ste. Marie-du-Mont, Manche, France: FIRST PRIZE, 15*l.*, for his 3 years, 2 months-old; bred by himself.

Pure Short Woolled (not Merino) Rams.

JOHN ISAAC WATTS, Whistley House, Devizes, Wilts: FIRST PRIZE, 15*l.*, for "President," 11 months, 1 week-old; bred by himself.

Pure Short Woolled (not Merino) Ewes or Gimmers, Pens of Five.

JOHN ISAAC WATTS, Whistley House, Devizes, Wilts: FIRST PRIZE, 15*l.*, for his 2 years, 1 month, 2 weeks-old; bred by himself.

GOATS.†

Male.

THE BARONESS BURDETT COUTTS, Holly Lodge, Highgate, Middlesex: FIRST PRIZE, 8*l.*, for "General," Hungarian short-haired, 4 years-old; breeder unknown.

FREDERICK AUGUSTUS CRISP, 338, Walworth Road, London: SECOND PRIZE, 4*l.*, for his Indian short-haired, about 5 years-old; bred by Mr. Hahn, Camberwell.

ISAAC MALLET, 111, Southampton Street, Camberwell, London: THIRD PRIZE, 2*l.*, for his three parts Indian long-haired, 3 years-old; bred by himself.

THOMAS HORROCKS MILLER, Singleton Park, Poulton-le-Fylde, Lancashire: the *Reserve Number* to "Cetywayo," Cashmere long-haired, 3 years, 3 months-old; bred by himself.

Female.

PROFESSOR JOHN WORTLEY AXE, the Wilderness, Pinner, Watford: SECOND PRIZE, 5*l.*, for "Usaga," Nubian short-haired, in-kid; age and breeder unknown.

---

† Given by a Committee of Subscribers.

HOPS.†

East Kent.

AUSTIN GAMBRILL, Chilham, Canterbury: FIRST PRIZE, 20*l.*

JOHN MARTEN, Bridge Street, Canterbury: SECOND PRIZE, 10*l.*

EDWIN NEAME, Harefield, Selling, Faversham: THIRD PRIZE, 5*l.*

Mid-Kent.

THE EARL OF DARNLEY, Cobham Hall, Gravesend: FIRST PRIZE, 20*l.*

JAMES FREEMAN, Otford, Sevenoaks: SECOND PRIZE, 10*l.*

Weald of Kent.

BENJAMIN BUSS, Spelmonden, Horsmonden: FIRST PRIZE, 20*l.*

Farnham.

ROBERT TYLER BARRETT, Erith Road, Kingsley, Farnham: FIRST PRIZE, 20*l.*

JAMES WALKER, Buriton, Petersfield: SECOND PRIZE, 20*l.*

Worcester and Hereford.

JOHN SMITH WALKER, Knightwick, Worcester: FIRST PRIZE, 20*l.*

THOMAS MEREDITH HOPKINS, Lower Wick, Worcester: SECOND PRIZE, 10*l.*

JOHN SMITH WALKER, Knightwick: THIRD PRIZE, 5*l.*

Hops Grown in any other District of England.

JOHN LONGSLEY, Manor Farm, Hagbourne, Didcot, Berks: FIRST PRIZE, 20*l.*

*Bale of Foreign Hops.**

JOHN BARTH and SONS, Nuremberg, Bavaria: FIRST PRIZE, 20*l.*; SECOND PRIZE, 10*l.*; and THIRD PRIZE, 5*l.*

ENGLISH WOOL.—*Three Fleeces.*

Border Leicester.—RICHARD TWEEDIE, The Forest, Catterick: FIRST PRIZE, 3*l.*

Cotswold.—RUSSELL SWANWICK, Cirencester: FIRST PRIZE, 3*l.*: and SECOND PRIZE, 2*l.*

Lincoln.—JOHN PEARS, Mere, Lincoln: FIRST PRIZE, 3*l.*

CAPTAIN CATLING, Needham Hall, Wisbech: SECOND PRIZE, 2*l.*

---

† Prizes given by a Committee of Hop Growers and Factors.

Kentish or Romney Marsh.—George Neve, Sissinghurst, Staplehurst: First Prize, 3*l.*

Henry Rigden, Lyminge, Hythe: Second Prize, 2*l.*

Oxfordshire Down.—H. Finch Hill, New Hall, Watford, Herts: First Prize, 3*l.*

George Street, Maulden, Ampthill, Beds: Second Prize, 2*l.*

Southdown.—Charles Durham, Aldenham Abbey, Watford, First Prize, 3*l.*

Shropshire.—John E. Farmer, Felton, Ludlow: First Prize, 3*l.*

Lord Chesham, Latimer, Chesham: Second Prize, 2*l.*

Hampshire.—William Parsons, West Stratton, Micheldever: First Prize, 3*l.*

Black-faced Mountain.—The Earl of Tankerville, Chillingham Castle, Alnwick: First Prize, 3*l.*

Herdwick.—Edward Nelson, Gatesgarth, Cockermouth: First Prize, 3*l.*

William Leathes, Lamplugh Hall, Cockermouth: Second Prize, 2*l.*

Lonk.—John Green and Son, Low House Farm, Silsden, Leeds: First Prize, 3*l.*

Devon Long Wool.—William and George Bird, Volis, Kingston, Taunton: Second Prize, 2*l.*

Somerset and Dorset Horned.—Herbert Farthing, Nether Stowey, Bridgwater: First Prize, 3*l.*

Dartmoor.—James Drewe, Artiscombe, Tavistock: First Prize, 3*l.*

Exmoor.—Lord Poltimore, Poltimore Park, Exeter: First Prize, 3*l.*

Limestone.—Rowland Parker, Moss End, Burton, Westmoreland: First Prize, 3*l.*

Roscommon.—Benjamin Hannan, Riverstown, Killucan, Ireland: First Prize, 3*l.*: and Second Prize, 2*l.*

BUTTER.

Irish keeping, 14 *lbs. or upwards.*

Matthew Anderson, Whitehill, Dromore, Tyrone, Ireland: First Prize, 5*l.*

David Quinlan, Ballyninnew, Carrick-on-Suir, Co. Tipperary: Second Prize, 3*l.*

Welsh keeping, 14 *lbs. or upwards.*

Richard Colley, Tylfaen, Welshpool: First Prize, 5*l.*

Thomas Davies, Pont Faen Farm, Rhuddlan, Rhyl: Second Prize, 3*l.*

English or Scotch keeping, 14 *lbs. or upwards.*

James Partington, Harefield Hall Farm, Heywood, Manchester: First Prize, 5*l.*

Joseph Saunders, North Lease Farm, Castle Carey, Somerset: Second Prize, 3*l.*

Canadian or American keeping, 14 *lbs. or upwards.**

F. S. Murray, New York: First Prize, 5*l.*

S. F. Stewart, Farley, Iowa, U.S: Second Prize, 3*l.*

French keeping, 14 *lbs. or upwards.**

A. Bourlé, Saumont-la-poterie, Neufchâtel-en-Bray (Seine-Inférieure): First Prize, 5*l.*

Poisson D'Arras, Roucherolles-en-Bray (Seine-Inférieure: Second Prize, 5*l.*

Scandinavian, keeping, 14 *lbs. or upwards.**

Mrs. Casperino de Lichtenberg, Hessel, Srenaa, Jutland: First Prize, 5*l.*, the Champion Prize,* value 10*l.*, and the large Silver Medal.

Anders Jepsen, Dalsager, Thisted, Jutland: Second Prize, 3*l.*

Other European keeping, 14 *lbs. or upwards.**

Toppe-ladugaards Mejeri, Toppelairigard, Klagirup, Sweden: First Prize, 5*l.*

J. Gottlich, Klammesbo, Borensberg, Sweden: Second Prize, 3*l.*

Fresh Butter, 6 *lbs., any make, English or Foreign.*

James Fitchett Burrell, Frimley, Farnborough Station, Surrey: First Prize, 10*l.*

Lord Ashburton, Grange Farm, Alresford, Hants: Second Prize, 6*l.*

M. Tanfin, Bouelle, Neufchâtel-en-Bray (Seine-Inférieure): Third Prize, 4*l.*

Captain Verschoyle, Springfields, Ross, Herefordshire: Fourth Prize, 2*l.*

CHEESE.*

Cheshire.

Three Cheeses, above Fifty Pounds weight each.

Jabez Hart, Bulkeley, Malpas, Cheshire: First Prize, 15*l.*

Thomas Williams, Alkington, Whitchurch, Salop: Second Prize, 10*l.*

Three Cheeses, under Fifty Pounds weight each.

Thomas H. Hodson, Edleston Farm, Nantwich: First Prize, 15*l.*

Thomas Williams, Alkington: Second Prize, 10*l.*

Cheddar.

Three Cheeses, above Fifty Pounds weight each.

William and Thomas Allen, Crookwood, Erchfort, Devizes: First Prize, 15*l.*

CHARLES CREES, Seymour's Court Farm, Beckington, Bath: SECOND PRIZE, 10*l.*

GEORGE GIBBONS, Tunley Farm, Bath: THIRD PRIZE, 5*l.*

Three Cheeses under Fifty Pounds weight each.

JAMES HODDINOTT, Hill House, Lipyeat, Bath: FIRST PRIZE, 15*l.*

WILLIAM and THOMAS ALLEN, Crookwood: SECOND PRIZE, 10*l.*

THOMAS JOHN MOON, Vallis Farm, Frome: THIRD PRIZE, 5*l.*

STILTON.

Three Cheeses under Twenty Pounds weight each.

JOHN B. LEADBEATER, Thorpe Satchville, Melton Mowbray: FIRST PRIZE, 15*l.*

WILLIAM COLEMAN, Long Clawson, Melton Mowbray: SECOND PRIZE, 10*l.*

THOMAS NUTTALL, Manor House, Beeby, Leicester: THIRD PRIZE, 5*l.*

BRITISH CREAM CHEESES.

Six of the same make.

AYLESBURY DAIRY COMPANY, St. Petersburg Place, Bayswater, London: FIRST PRIZE, 10*l.*

MISS AGNES JACOMB, The Mount, Pinner, Watford: SECOND PRIZE, 5*l.*

ANY OTHER BRITISH MAKE.

Three Cheeses above Twenty-five Pounds weight each.

WILLIAM T. CARRINGTON, Croxden Abbey, Uttoxeter: FIRST PRIZE, 15*l.*

CHARLES CREES, Seymour's Court Farm, Beckington, Bath: SECOND PRIZE, 10*l.*

JOHN CHEYNE, Pinwall Grange, Atherston: THIRD PRIZE, 5*l.*

Three Cheeses not exceeding Twenty-five Pounds weight each.

WILLIAM S. CARRINGTON, Croxton Abbey: FIRST PRIZE, 15*l.*

JAMES HODDINOTT, Hill House, Lipyeat, Bath: SECOND PRIZE, 10*l.*

JOHN SMITH, Neepdown Farm, Thornbury, Gloucestershire: THIRD PRIZE, 5*l.*

EDAM.

*Three Cheeses of the same make.**

REYER KLAVER, Zybecarspel, Medemblik, Holland: SECOND PRIZE, 5*l.*

GRUYÈRE.

*Three Cheeses of the same make.**

ALEXIS F. DEDRON, Aarwangen, Suisse.

CAMEMBERT.

*Six Cheeses of the same weight.**

PAUL LEVESTRE PAUL, Bonvilliers, Calvados: FIRST PRIZE, 10*l.*
MALVINA FRÈRE, Notot-en-Ange, Calvados: SECOND PRIZE, 5*l.*

ROQUEFORT.

*Three Cheeses of the same make.**

ETIENNE COUPIAC, Roquefort, Aveyron, France: FIRST PRIZE, 10*l.*

FRENCH CREAM CHEESES.

*One Dozen or more of the same make.**

ARMAND JOLY, Massy, Neufchâtel-en-Bray, France: FIRST PRIZE, 10*l.*
DOMINIQUE MOREL, Monterolier, Neufchâtel-en-Bray: SECOND PRIZE, 5*l.*

HAMS AND BACON.

Six British Hams, from Ten to Twenty-eight Pounds each.

ROBERT GREAVES, Gosforth, Carnforth: FIRST PRIZE, 15*l.*
RICHARD WOODALL, Lane End, Waberthwaite, Cumberland: SECOND PRIZE, 10*l.*
JOHN TYSON, Bridge Buildings, Egremont, Cumberland: THIRD PRIZE, 5*l.*

Three Sides of British Bacon, from Fifty Pounds each.

CHARLES HARRIS and Co., Calne, Wilts: FIRST PRIZE, 15*l.*
D. A. PAYNE and Co., Trowbridge: SECOND PRIZE, 10*l.*
MESSRS. DALZELL and GRAY, King Street, Whitehaven: THIRD PRIZE, 5*l.*

PRESERVED MEATS.*

Beef—the best specimen.

LOW, HUCKVALE, and Co., 4, Billiter Street, London: PRIZE, 10*l.*

Other Provisions—the best specimen.

E. A. SCHNEIDER, 4, Cambria Villas, Cambridge: PRIZE, 5*l.*

PERRY.†

Three Dozen Quart Bottles.

WILLIAM H. APPERLEY, Withington, Hereford: FIRST PRIZE, 10*l.*
JOHN WATKINS, Wisterton Court, Marden, Herefordshire: SECOND PRIZE, 5*l.*

† Prizes given by M. Biddulph, Esq., M.P.

CIDER.†

Cask of not less than Fifty-four Gallons, made in 1878 *in Herefordshire and the West Midland Counties.*

JOSEPH DAVIES, Venn's Green, Marden, Herefordshire: FIRST PRIZE, 10*l.*

JOHN WATKINS, Wisteston Court, Marden: SECOND PRIZE, 5*l.*

Cask of not less than Fifty-four Gallons, made in 1878, *in Devonshire and Western Counties.*

JAMES S. BULT, Dodhill House, Kingston, Taunton: FIRST PRIZE, 10*l.*, and the CHAMPION PRIZE † of 5*l.*

WILLIAM BOND, Westborough Farm, Coombe-in-Teignhead, Teignmouth, SECOND PRIZE, 5*l.*

Three Dozen Quart Bottles, Herefordshire and West Midland.

JOHN BOSLEY, Lyde House, Hereford: FIRST PRIZE, 10*l.*, and the CHAMPION PRIZE * of 5*l.*

JOSEPH DAVIES, Venn's Green Farm: SECOND PRIZE, 5*l.*

Three Dozen Quart Bottles, Devonshire and Midland Counties.

JAMES W. PAULL, Knott Oak House, Ilminster, Somerset: FIRST PRIZE, 10*l.*

WILLIAM BOND, Westborough Farm: SECOND PRIZE, 5*l.*

HIVES AND BEES‡ (BRITISH OR FOREIGN).

Observatory Hive, stocked with Bees and their Queen.

W. R. FREEMAN, 3, Lorne Villas, Brockley Road, Forest Hill: FIRST PRIZE, 3*l.*

BRICE WILSON, Newbury, Berks: SECOND PRIZE, 2*l.*

J. A. ABBOTT, Fairlawn, Southall, Middlesex: THIRD PRIZE, 1*l.*

Hive on the Movable Comb principle, with Covering and Stand complete.

MESSRS. ABBOTT BROS., Fairlawn, Southall: FIRST PRIZE, 3*l.*

J. M. HOOKER, Heathfield, Sevenoaks, Kent: SECOND PRIZE, 2*l.*

MESSRS. NEIGHBOUR and SON, 149, Regent Street, London: THIRD PRIZE, 1*l.*

Pure Honey in Sectional Supers.

THE AMERICAN NATIONAL BEE-KEEPERS' ASSOCIATION, 10, West Broadway, New York: FIRST PRIZE, 3*l.*

S. THORNE, Ashwell, Baldock, Herts: SECOND PRIZE, 2*l.*

LUCIO PAGLIA: Castel S. Pietro, Bologna, Italy: THIRD PRIZE, 1*l.*

† Prizes given by M. Biddulph, Esq., M.P.
‡ Prizes given by the Bee-Keepers' Association.

The Competitor who shall in the neatest, quickest, and most complete manner drive out the Bees from a Straw Hive, capture and exhibit the Queen, and transfer both Combs and Bees to a Hive on the Movable Comb principle.

C. N. Abbott, Fairlawn, Southall: First Prize, 3*l.*

S. J. Baldwin, Gipsy Cottage, South Vale, Upper Norwood: Second Prize, 2*l.*

W. Martin, Neighbour and Son's Bee Farm, West End, Hampstead, Middlesex: Third Prize, 1*l.*

IMPLEMENTS.

Railway Waggons for conveying perishable goods long distances at a low temperature.†

The Swansea Waggon Company, Swansea, South Wales: a Gold Medal and 50*l.* for "Knott's patent."

Colonel W. D'Alton Mann, 116, Piccadilly, W. *Commended* for principles of construction and finish.

Silver Medals.

A. Ransome and Co., Stanley Works, Chelsea, London: for Machinery for making Butter-firkins.

Samuelson and Co., Britannia Works, Banbury: for their Patent Hay Press.

McKenzie and Sons, Limited, of Camden Quay, Cork, Ireland: for their Gorse Masticator,

The Aylesbury Dairy Company, St. Petersburg Place, Bayswater, London: for their Dairy Appliances at work in the International Dairy.

G. De Laval: for his Swedish Cream Separator.

Carter and Co., High Holborn, London;

Little and Ballantyne, Carlisle;

Paul and Son, Cheshunt;

W. Paul and Son, Waltham Cross; and

W. Cutbush and Son, Highgate: for their efforts, under the unfavourable circumstances of the weather, to decorate the railway embankment projecting into the Exhibition grounds.

Honourable Mention

For Foreign Collections of Implements.

H. F. Eckert, Berlin, Germany.

Le Comte de Beaurepaire, Grivesnes (Somme), France.

---

† Offered by the Mansion House Committee.

Alfred Clert, Niort (Deux-Sèvres), France.

Eduard Ahlborn, Hildesheim, Germany.

Odile Martin, Jardin d'Acclimatation, Paris.

M. Voitellier, Mantes (Seine-et-Oise), France.

Rouillier and Arnoult, Gambais, Versailles (Seine-et-Oise), France.

Simon Legrand, Bersée, par Pont à Marcq.

A. Engström, 13, Faubourg Poissonnière, Paris.

First Class Mention.

Hornsby and Sons, Spittlegate, Grantham, Lincolnshire: for their Improved Disc in Patent Turnip Cutter.

William Brenton, East Cornwall Implement Works, Polbathix, St. Germains: for his Samples of Patent Door and Gate Fastenings.

The Kirkstall Forge Company, Kirkstall Forge, Leeds: for their Patent Rolled Shafting.

Henry Brinsmead, Ipswich: for his Patent Double-action Straw Shaker.

George H. Innes, Market Hull, Royston, Hertford: for his Drum Guard attached to Thrashing Machine.

Francis Ley, Vulcan Iron Works, Derby; for Ewart's Patent Detachable Malleable Iron Drive Chain.

Polyblank and Co., Newton Abbot, Devon: for Knowling's Patent Band-sawing Machine.

Nalder and Nalder (Limited), Challow Iron Works, Wantage; for their Straw Elevator attached to Thrashing Machine.

P. and H. P. Gibbons, Vale of White Horse Iron Works, Wantage: for their Drum Guard attached to Thrashing Machine.

Second Class Mention.

François L. Heron, Brest, Department of Finistère, France: for his Agricultural Barrow.

The Pulsometer Engineering Company (Limited), 61 and 63, Queen Victoria Street, London: for their Centrifugal Grinding and Sifting Mill.

Entwisle and Kenyon, Embankment Works, Accrington: for Riley's Patent Engineers' Vice.

Everitt, Adams, and Co., St. Andrew's Works, Ryburgh: for their Patent Double-row Turnip Thinner.

Nicolas Noel, 112, Avenue Parmentier, Paris: for his Valve attached to Pump.

Thomas Adams, West Gorton, Manchester: for his Patent Spring Safety Valve.

T. Christy and Co., 155, Fenchurch Street, London: for their Hydro-Incubator.

PLANS OF FARM BUILDINGS.

Arable Farms above 300 *acres.*

COMMENDED.

RICHARD WAITE, Duffield, Derby.
A. DUDLEY CLARKE, Sundorne, Shrewsbury.
W. J. MOSCROP and W. J. MOSCROP, Jun., Leybourne Terrace, Yarmouth Road, Stockton-on-Tees.
J. E. WATSON, Newcastle-on-Tyne.

Arable Farms not exceeding 300 *acres.*

COMMENDED.

C. and J. CADLE, Gloucester.
F. E. WALKER, The Depperhaugh, Scole, Norfolk.

Dairy Farms above 100 *acres.*

HIGHLY COMMENDED.

W. A. KEATES, 7, Market Square, Hanley, Staffordshire.

MARKET GARDENS AND MARKET GARDEN FARMS.*

Market Gardens within a radius of 20 *miles from the Mansion House, exceeding* 10 *and not exceeding* 50 *acres in extent.*

WILLIAM JOHN GAY, Barking, Essex: FIRST PRIZE, 50*l.*
WILLIAM GAY, Corbetstye, Romford, Essex.

Market Gardens within a radius of 25 *miles from the Mansion House, above* 50 *acres in extent.*

JOHN LANCASTER, Vine House, Canning Town, Essex: FIRST PRIZE, 50*l.*
THOMAS PATCH, Faircross, Barking, Essex: SECOND PRIZE, 25*l.*

Market Garden Farms situated in one of the five Metropolitan Counties, or if in any other County within a radius of 50 *miles from the Mansion House, on which Market-garden Crops alternated with Farm-crops, above* 100 *acres in extent.*

HENRY SWANN, Manager to the Trustees of the late J. C. CIRCUIT, Esq., Rainham, Essex: FIRST PRIZE, 50*l.*
W. WALLIS GLENNY, Cecil House, Barking, Essex: SECOND PRIZE, 25*l.*

AGRICULTURAL EDUCATION.

Examination Papers, 1879.

EXAMINATION IN BOOK-KEEPING.

MAXIMUM NUMBER OF MARKS, 200. PASS NUMBER, 100.

Monday, April 7th, from 2 p.m. till 5 p.m.

Journalise and post into a ledger, in proper technical form and language, the following series of facts and transactions, and, from such ledger, make out a Trial Balance, a Profit and Loss Account, and a Balance Sheet.

Liabilities and Assets of JAMES GILES, *30th June*, 1878.

LIABILITIES.

	£	s.	d.
Amount due to R. Leonard	670	2	9
Do. J. Elwin	250	4	3
Acceptance to R. Miller's Draft, due 25th August, 1878	150	7	0
Do. F. Paul's Draft, due 15th July, 1878 ..	240	6	0
	£1311	0	0

ASSETS.

Stock of Oil Cake, valued at	1000	0	0
Do. Oats	500	0	0
Barley, to arrive per S.S. "Cathay," cost to date ..	600	7	6
Horses and Carts	150	0	0
Stock of Provender for Horses	50	0	0
Freehold Premises	700	0	0
Cash at Robarts, Lubbock and Co.	200	0	0
Petty Cash in hand	25	12	6
	£3226	0	0

1878.

July 1. Bought of J. Elwin a parcel of Oats, invoiced at	350	0	0
„ 2. Accepted R. Leonard's Draft, due 5th October	550	0	0
„ „ Sold F. Paul Oil Cake, charged to him, at ..	525	0	0

1878.		£	s.	d.
July 3.	Consigned to R. Miller, Oil Cake, from Stock, cost	490	0	0
„ „	Sold G. Nesbitt, a parcel of Oats, invoiced at	625	7	8
„ 4.	Received from G. Nesbitt, his acceptance to my Draft, due 7th October	500	0	0
„ „	Charged him Interest	6	5	8
„ „	Discounted with Bankers, G. Nesbitt's Draft, for	500	0	0
„ „	Discount charged by Bankers	5	3	8
„ 5.	Paid J. Elwyn by Cheque	300	0	0
„ „	Accepted J. Elwin's Draft, due 8th November	250	0	0
„ „	Paid Freight on Barley, per S.S. "Cathay"	68	9	6
„ 7.	Sold R. Miller, Oil Cake, consigned to him for	508	4	0
„ 8.	Received of R. Miller, Cash Remittance of	508	4	0
„ 9.	Sold J. Elwin, the Parcel of Barley, per S.S. "Cathay," for	680	8	4
„ 13.	F. Paul's Acceptance, due 15th, paid into Bank, and duly met at maturity	240	6	0
„ „	Received of F. Paul, his Acceptance to my Draft, due 5th September, for	275	0	0
„ „	Received of F. Paul, a Cash Remittance of	250	0	0
„ 16.	Office Expenses paid for Stationery out of Petty Cash	5	4	0
„ „	Drew a Cheque on Account of Petty Cash for	10	0	0
„ 20.	Sold R. Leonard, a Parcel of Oats, invoiced at	110	5	0
„ 25.	Bought of G. Nesbitt, a Parcel of Oats, invoiced at	110	5	6
„ 31.	Cash, paid Salaries and Wages, by Cheque on Bankers	28	0	0
„ „	Cash drawn out on Private Account	45	0	0
„ „	Interest on Capital, one month, at 5 per cent.	7	19	7
„	Value of Oats on hand, 31st July, 1878 ..	345	15	0
„	Stock of Horse Provender on hand, 31st July, 1878	40	0	0
„	Depreciation in Value of Premises	3	10	0

EXAMINATION IN AGRICULTURE.

MAXIMUM NUMBER OF MARKS, 200. PASS NUMBER, 100.

Tuesday, April 8th, from 10 *a.m. till* 1 *p.m.*

1. Modern science having rendered unnecessary some of the ancient restrictions on the cultivation of land, give a rotation of cropping adapted for—

(1) Light land suited for turnip culture;
(2) Stronger soil adapted for beans, but on which roots can ordinarily be consumed.;
(3) Deep alluvial soil of good quality;—

which shall keep the land sufficiently clean, and shall not be of an excessively scourging character.

2. State the manures (both farmyard and artificial) which you would ordinarily apply for each crop in each of the rotations alluded to in the preceding question, assuming the farm to be two-thirds arable, and all the straw and roots grown to be consumed on the land.

3. On a farm of 600 acres, of which two-thirds are turnip-land of fair quality, and the pastures of an ordinary description, what would be the ordinary amount of stock (*a*) wintered and (*b*) summered? In giving sheep-stock, specify ewes, lambs, and hoggets; and give cattle and horses.

4. Upon a farm of this description, how would you feed the horses winter and summer?

5. In feeding good cart-horses, in full work during the winter months, mention what would be the relative cost of the corn given them with old beans at 42*s.* per quarter; maize at 26*s.* per quarter; and good 12-stone oats at 20*s.* per quarter; a sufficient allowance of any one of the three being given, and assuming the horses to have clover, hay, *ad libitum*, besides their corn?

6. State if, in your opinion, any modification or mixture of such foods would be desirable, giving your reasons for such change.

7. Give the relative value (according to Lawes and Voelcker) of the manure made by cattle consuming them from—

(1) Linseed Cake,
(2) Maize,
(3) Undecorticated Cotton Cake,
(4) Decorticated ditto,
(5) Mangolds,
(6) Wheat Straw.

8. On a farm where a large proportion of young stock (both cattle and sheep) are reared, what artificial foods would you consider it most desirable to use?

9. In the purchase of artificial manures, what percentages of soluble and insoluble phosphates and of ammonia would you think it desirable to secure in—

(1) Ordinary mineral superphosphate;
(2) Good bone superphosphate;
(3) Peruvian guano;
(4) Sulphate of ammonia;

and what proportion of pure nitrate would you insist on in nitrate of soda?

10. Which of these manures would you prefer for top dressing barley after wheat, where no farmyard-manure has been applied, but where 3 cwt. of mineral superphosphate has been drilled with the seed? State the quantity of such manure or manures which, in your opinion, might advantageously be employed.

11. Give some of the indications by which you would judge of the fertility (or otherwise) of a farm in such bad condition that it owed little to artificial methods of cultivation.

12. What mixture of clovers and grasses do you consider best on land with which you are acquainted—

(1) For one year's seeds;
(2) For permanent pasture?

13. How would you lay down land for permanent grass? What time would you sow the seed? What would be your subsequent treatment for the first three or four years?

14. On good land, well farmed, what would you consider a good crop of each of the following:—

(1) Wheat,
(2) Barley,
(3) Oats,
(4) Beans,
(5) Peas,
} stated in qrs. or bushels;

(6) Potatoes,
(7) Mangolds,
(8) Swedes,
(9) Common turnips,
} stated in tons?

15. If you have a crop of mangolds, 2 feet apart in the rows, and 1 foot apart in drills, which average 7 lbs. each in weight, what is the weight of your crop per acre?

16. State the simplest method of ascertaining the weight per acre of roots on a field where it is not practicable to weigh the entire crop, but where samples only of the best and worst parts of the crop can be selected.

17. What amount per annum should suffice for the labour of a mixed land farm of 600 acres, of which one-third is grass, and which is cropped according to the usual course and covenants?

18. It is impossible entirely to separate the cost of the arable and the grass lands; but, speaking generally, what amount of the above (Q. 17) would you apportion to the grass and the plough?

12. You have fair fattening bullock land, which you value to your-

self at 3*l.* per acre. You are accustomed to buy cattle at 2½ years old at about 18*l.* apiece in the autumn, and after wintering them in straw-yards with a small quantity of roots and 4 lbs. of cake per diem, you graze them on the land in question; what would you consider a fair average price to make of them from grass without allowing them any cake during the grazing season?

20. Classify the most important breeds of British sheep and cattle, and state the localities in which they are usually to be found.

EXAMINATION IN BOTANY.

[It is expected that Eight Questions at least will be answered.]

MAXIMUM NUMBER OF MARKS, 100. PASS NUMBER, 50.

Tuesday, April 8th, from 2 p.m. till 5 p.m.

1. Explain the phenomena of nutrition in a unicellular alga.

2. Give an account of the influence of light and heat on a plant.

3. Explain the difference between an albuminous and an exalbuminous seed. What is the use of albumen, and how do plants get on that are without it?

4. Give an account with drawings of the structure and different parts of a grain of wheat.

5. What is meant by insect agency in fertilization? Give some examples from British plants.

6. What are the benefits that may be expected from selected hybridization? Specify the affinities within which it may be carried out.

7. Explain the nature and relation to the different parts of the flower of the following fruits:—Strawberry, Mulberry, Barberry, and Cranberry.

8. What are smut and bunt? What action would you recommend to prevent their attacking crops?

9. Give the technical names and Natural Orders of the turnip, beet, carrot, onion, and potato.

10. Name and describe in technical language the plants A, B, and C.

EXAMINATION IN CHEMISTRY.

MAXIMUM NUMBER OF MARKS, 200. PASS NUMBER, 100.

I. AGRICULTURAL CHEMISTRY.

Wednesday, April 9th, from 10 a.m. till 1 p.m.

1. What are the principal chemical characters of Peat, and the best means of improving peaty soils?

2. Mention some of the products of the dry Distillation of Peat, their composition, properties, and uses.

3. How do you distinguish Wood Charcoal from Animal Charcoal? How do you analyse Animal Charcoal?

4. What is the composition of Ammoniacal liquor of gas-works? How do you determine its strength? How much Sulphate of Ammonia can you obtain from 100 gallons of a liquor which contains 12 ounces of Carbonate of Ammonia in the gallon?

5. What is the composition of Kainite, and how do you determine the percentage of Potash which it contains?

6. Explain the action of the following substances as disinfectants:—Lime, Charcoal, Hypochlorite of Lime, Sulphurous Acid, Carbolic Acid, Permanganate of Potash.

7. Explain the chemical changes, if any, that occur in the following solutions in the act of percolating cultivated soils:—Nitrate of Soda, Sulphate of Ammonia, Chloride of Sodium, Sulphate of Potash, Soluble Phosphate of Lime.

8. What is the composition of Decorticated and Undecorticated Cotton Cake, and their comparative feeding and manurial value?

9. Write a short paper on the composition of Town-sewage, and its application for agricultural purposes.

II. General Chemistry.

Wednesday, April 9th, from 2 p.m. till 5 p.m.

1. Describe the chief chemical characters of sulphur, chlorine, and zinc, respectively. Name other elements which resemble them respectively, and state the points of resemblance.

2. State the composition of ammonia by weight, and by volume. Describe and explain the preparation of ammonia from sal-ammoniac (1) in the gaseous condition, (2) in the state in which it is usually sold; and explain the change of temperature which occurs in the latter case.

3. Given a solution of ammonia of which it is required to determine the strength, show how to do it, and explain the principles of your method.

4. Describe some one hydro-carbon; state how it is to be obtained; and calculate the quantity of oxygen required for its complete combination.

5. Explain the action of chlorine with (1) sulphuretted hydrogen, (2) metallic iron, (3) ferrous sulphate, (4) caustic soda.

6. State the laws of gaseous diffusion and illustrate them by some examples. Show why a fire burning in an ordinary open fireplace serves to keep the atmosphere of the room sweet, and why a fire in a close iron stove does not produce such an effect.

7. Explain how cane-, grape-, and milk-sugar are related to one another, and to starch. Under what conditions is milk-sugar converted into lactic acid?

8. Give tests by which you can detect (1) copper nitrate, (2) sodium phosphate in a solution; and explain the chemistry of your tests.

9. Explain the causes of hardness of water; also which of them are curable, and by what means?

EXAMINATION IN MECHANICS AND NATURAL PHILOSOPHY.

MAXIMUM NUMBER OF MARKS, 200. PASS NUMBER, 100.

Thursday, April 10th, from 10 a.m. till 1 p.m.

1. What is the momentum of a moving body?

If two bodies weigh 100 lbs. and 2 cwts. respectively, and the former is moving at the rate of 180 yards a minute, and the latter at the rate of 30 miles an hour; what is the ratio of their momenta?

2. A particle placed on a smooth inclined plane is tied by a thread to a point near the top of the plane; how is the pull of the particle on the thread found?

If the height and base of the plane are respectively 5 feet and 12 feet and the particle weighs 39 ounces; what pull does it exert on the thread?

3. A and B are two points 12 feet apart, and so placed that the line adjoining them is inclined at an angle of 30° to the horizon; a thread, 18 feet long, has its ends fastened to A and B; a weight of 200 lbs. is tied to the middle point of the thread; find (by a construction or otherwise) the tensions of the parts of the thread.

4. What is the sensibility of a balance?

Show that the sensibility is increased when the centre of gravity of the beam is brought nearer to the point of support.

5. A mass of 20 lbs. is moving with a velocity of 40 feet a second; what is its kinetic energy? If its motion were resisted by a constant force equal to that of gravity on a pound of matter ($g = 32$), how far would it move before coming to rest?

6. What is the specific gravity of a substance?

Describe a specific gravity-bottle, and state how it is used for finding the specific gravity of a liquid.

The weight of distilled water which a specific gravity-bottle will

hold is 1050 grains; if it is capable of holding 910 grains of another liquid, what is the specific gravity of that liquid?

7. Explain the action of a common siphon, and why water can be drawn off only to a lower level by means of it.

8. What are the freezing and boiling points of a Thermometer, and by what means are they determined? How are the scales on Fahrenheit's and the Centigrade thermometer graduated? When Fahrenheit's thermometer reads 158°, what should the reading of the Centigrade thermometer be?

9. What is the condenser of an ordinary stationary steam-engine, and what is its use? If the condenser acted imperfectly, what effect would this have on the power of the steam-engine?

EXAMINATION IN MENSURATION AND SURVEYING.

MAXIMUM NUMBER OF MARKS, 100. PASS NUMBER, 50.

Thursday, April 10th, from 2 p.m. till 5 p.m.

1. State the rules or formula for finding the circumference and area of a circle, in terms of its radius.

The circumference of a circle is found by measurement to be 12 feet; what is its area?

2. Given that a brick measures 9 inches by $4\frac{1}{2}$ inches by 3 inches; calculate the number of bricks in a pile 24 feet long, 15 feet wide, and 6 feet high.

3. A ditch is cut 10 feet wide at top, 4 feet deep, and with sides sloping at the rate of two vertical to one horizontal; how many cubic yards of earth are moved in making 450 feet of the length of the ditch?

4. The horizontal plan of a piece of land is a square, with a side of 100 feet; two of the sides of the land are horizontal, and, reckoning vertically, one is 10 feet above the other; the ground is to be levelled by digging out earth from the higher and heaping it so as to raise the lower part; assuming that the earth on all sides, both of cutting and embankment, is at a uniform slope of one vertical to one horizontal, draw a plan of the horizontal surface of the ground thus obtained, and calculate its area.

5. It is found that two points on a plan are an inch apart; it is

known that their actual distance from each other is 45 yards; what is the length of a line on the plan representing a line whose actual length is 200 yards? Draw the line and divide it so as to form a scale adapted for reading distances on the plan from 5 yards up to 200 yards.

6. Explain briefly the principle of the vernier. If the arc of the instrument is divided to read to half-degrees; how must the vernier be divided to read to half-minutes?

7. Two sides of a triangle are 753 feet, and 492 feet long, and contain an angle of 103° 30′; (1) draw the triangle to scale, and note the length of the third side; (2) calculate trigonometrically the length of the third side.

8. In the last question, find the area of the triangle; (1) by means of a trigonometrical calculation; (2) by means of measurements made on the drawing.

9. To find the area of a narrow piece of ground, a line (AB) is chained down the middle of it, and off-sets are taken to the right and left, according to the accompanying notes; draw the boundaries, and calculate the area between them and the extreme off-sets.

	B	
60	1250	0
180	1010	
	800	70
130	550	
	450	150
	340	100
210	250	
100	000	120
	A	

EXAMINATION IN GEOLOGY.

MAXIMUM NUMBER OF MARKS, 100. PASS NUMBER, 50.

Saturday, April 12th, from 10 a.m. till 1 p.m.

1. Explain clearly the principles upon which the stratified rocks have been classified into great groups. Give the names assigned to them.

2. Name the various subaërial agents of denudation, and briefly describe the effects produced by any one of them.

3. Tabulate to descending order the divisions of the Oolitic rocks; mention their lithological characters, and the nature of the soils derived from them.

4. Mention some of the characteristic fossils of the Palæozoic period, and give their zoological position.

5. Enumerate the British strata in which phosphatic deposits of commercial value are found. Explain the nature and probable origin of the phosphatic matter.

6. Define what is meant by the terms "mechanically," "chemically," and "organically" formed rocks. Give examples of them.

7. Mention the various kinds of clays or argillaceous rocks which have been used for economical purposes in the British Islands.

8. Point out the advantage of a knowledge of fossils to the geologist.

9. What are the geological positions of the following deposits:—Rock-salt, Purbeck marble, Fire-clay, Moorland coal, Stonesfield slate, and Cornstones.

10. To what different agencies has the formation of soils been attributed? How have soils been classified?

EXAMINATION IN ANATOMY AND ANIMAL PHYSIOLOGY.

MAXIMUM NUMBER OF MARKS, 100. PASS NUMBER, 50.

Saturday, April 12th, from 2 p.m. till 5 p.m.

1. Describe the processes of digestion and assimilation in the Ox. Name the organs which take part therein, and explain their combined and separate functions.

2. Describe in general terms the anatomy of the heart and blood-vessels. Give a full description of the circulation, specially noting the changes which the blood undergoes while passing through the several vessels of the body.

3. Name the leading characteristics of the Chyle, the changes it undergoes and its uses. State also how it enters the circulation.

MEMORANDA.

ADDRESS OF LETTERS.—The Society's office being situated in the postal district designated by the letter W, Members, in their correspondence with the Secretary, are requested to subjoin that letter to the usual address.

GENERAL MEETING in London, December 11th, 1879.

GENERAL MEETING in London, May 22, 1880, at 12 o'clock.

MEETING in Carlisle, July 12th and four following days, 1880.

MONTHLY COUNCIL (for transaction of business), at 12 o'clock on the first Wednesday in every month, excepting January, September, and October: open only to Members of Council and Governors of the Society.

ADJOURNMENTS.—The Council adjourn over Passion and Easter weeks, when those weeks do not include the first Wednesday of the month; from the first Wednesday in August to the first Wednesday in November; and from the first Wednesday in December to the first Wednesday in February.

OFFICE HOURS.—10 to 4. On Saturdays, 10 to 2.

DISEASES of Cattle, Sheep, and Pigs.—Members have the privilege of applying to the Veterinary Committee of the Society, and of sending animals to the Royal Veterinary College, Camden Town, N.W.—(A statement of these privileges will be found on page cliii.)

CHEMICAL ANALYSIS.—The privileges of Chemical Analysis enjoyed by Members of the Society will be found stated in this Appendix (page cliv).

BOTANICAL PRIVILEGES.—The Botanical and Entomological Privileges enjoyed by Members of the Society will be found stated in this Appendix (page clvii).

SUBSCRIPTIONS.—1. Annual.—The subscription of a Governor is £5, and that of a Member £1, due in advance on the 1st of January of each year, and becoming in arrear if unpaid by the 1st of June. 2. For Life.—Governors may compound for their subscription for future years by paying at once the sum of £50, and Members by paying £10. Governors and Members who have paid their annual subscription for 20 years or upwards, and whose subscriptions are not in arrear, may compound for future annual subscriptions, that of the current year inclusive, by a single payment of £25 for a Governor, and £5 for a Member.

PAYMENTS.—Subscriptions may be paid to the Secretary, in the most direct and satisfactory manner, either at the Office of the Society, No. 12, Hanover Square, London, W., or by means of post-office orders, to be obtained at any of the principal post-offices throughout the kingdom, and made payable to him at the Vere Street Office, London, W.; but any cheque on a banker's or any other house of business in London will be equally available, if made payable on demand. In obtaining post-office orders care should be taken to give the postmaster the correct initials and surname of the Secretary of the Society (H. M. Jenkins), otherwise the payment will be refused to him at the post-office on which such order has been obtained; and when remitting the money-orders it should be stated by whom, and on whose account, they are sent. Cheques should be made payable as drafts on demand (not as bills only payable after sight or a certain number of days after date), and should be drawn on a London (not on a local country) banker. When payment is made to the London and Westminster Bank, St. James's Square Branch, as the bankers of the Society, it will be desirable that the Secretary should be advised by letter of such payment, in order that the entry in the banker's book may be at once identified, and the amount posted to the credit of the proper party. No coin can be remitted by post, unless the letter be registered.

NEW MEMBERS.—Every candidate for admission into the Society must be proposed by a Member; the proposer to specify in writing the full name, usual place of residence, and post-town, of the candidate, either at a Council meeting, or by letter addressed to the Secretary. Forms of Proposal may be obtained on application to the Secretary.

*** Members may obtain on application to the Secretary copies of an Abstract of the Charter and Bye-laws, of a Statement of the General Objects, &c., of the Society, of Chemical, Botanical, and Veterinary Privileges, and of other printed papers connected with special departments of the Society's business.

Members' Veterinary Privileges.

I.—Serious or Extensive Diseases.

1. Any Member of the Society who may desire professional attendance and special advice in cases of serious or extensive disease among his cattle, sheep, or pigs, and will address a letter to the Secretary, will, by return of post, receive a reply stating whether it be considered necessary that the Society's Veterinary Inspector should visit the place where the disease prevails.

2. The remuneration of the Inspector will be 2*l.* 2*s.* each day as a professional fee, and 1*l.* 1*s.* each day for personal expenses; and he will also be allowed to charge the cost of travelling to and from the locality where his services may have been required. The professional fee will be paid by the Society, but the travelling expenses will be a charge against the applicant. This charge may, however, be reduced or remitted altogether at the discretion of the Council, on such step being recommended to them by the Veterinary Committee.

3. The Inspector, on his return from visiting the diseased stock, will report to the Committee, in writing, the results of his observations and proceedings, which Report will be laid before the Council.

4. When contingencies arise to prevent a personal discharge of the duties confided to the Inspector, he may, subject to the approval of the Committee, name some competent professional person to act in his stead, who shall receive the same rates of remuneration.

II.—Ordinary or Other Cases of Disease.

Members may obtain the attendance of the Veterinary Inspector on any case of disease by paying the cost of his visit, which will be at the following rate, viz., 2*l.* 2*s.* per diem, and travelling expenses. Applications should be addressed to the Principal of the Royal Veterinary College, Camden Town, London, N.W.

III.—Consultations without Visit.

Personal consultation with Veterinary Inspector	10*s.* 6*d.*
Consultation by letter	10*s.* 6*d.*
Post-mortem examination, and report thereon	21*s.*

A return of the number of applications from Members of the Society during each half-year is required from the Veterinary Inspector.

IV.—Admission of Diseased Animals to the Royal Veterinary College, Camden Town, N.W.; Investigations and Reports.

1. All Members of the Society have the privilege of sending cattle, sheep, and pigs to the Infirmary of the Royal Veterinary College, on the following terms; viz., by paying for the keep and treatment of cattle 10*s.* 6*d.* per week each animal, and for sheep and pigs, 3*s.* 6*d.* per week.

No. 2. A detailed Report of the cases of cattle, sheep, and pigs treated in the Infirmary of the College or on Farms in the occupation of Members of the Society, will be furnished to the Council quarterly; and also special reports from time to time on any matter of unusual interest which may come under the notice of the Institution.

By Order of the Council,

H. M. JENKINS, *Secretary.*

Members' Privileges of Chemical Analysis

(Applicable only to the case of Persons who are not commercially engaged in the manufacture or sale of any substance sent for Analysis).

The Council have fixed the following rates of Charges for Analysis to be made by the Consulting Chemist for the *bonâ-fide* and sole use of Members of the Society; who, to avoid all unnecessary correspondence, are particularly requested, when applying to him to mention the kind of analysis they require, and to quote its number in the subjoined schedule. The charge for analysis, together with the carriage of the specimens (if any), must be paid to him by Members at the time of their application:

No. 1.—An opinion of the genuineness and value of bone-dust or oil-cake (each sample) .. .. 5*s.*

„ 2.—An estimate of the value (relatively to the average samples in the market) of sulphate and muriate of ammonia and of the nitrate of potash and soda .. .. 5*s.*

„ 3.—An analysis of guano; showing the proportion of moisture, organic matter, sand, phosphate of lime, alkaline salts and ammonia, and an estimate of its value, provided the selling price of the article to be analysed be sent with it .. .. 10*s.*

„ 4.—An analysis of mineral superphosphate of lime for soluble phosphates only, and an estimate of its value, provided the selling price of the article to be analysed be sent with it .. 5*s.*

„ 5.—An analysis of superphosphate of lime, showing the proportions of moisture, organic matter, sand, soluble and insoluble phosphates, sulphate of lime, and ammonia, and an estimate of its value, provided the selling price of the article to be analysed be sent with it .. .. 10*s.*

„ 6.—An analysis, showing the value of any ordinary artificial manure 10*s.*

„ 7.—An analysis of limestone, showing the proportion of lime .. 7*s.* 6*d.*

„ 8.—An analysis of limestone, showing the proportion of magnesia, 10*s.*; the proportion of lime and magnesia .. .. .. 10*s.*

„ 9.—An analysis of limestone or marls, showing the proportion of carbonate, phosphate, and sulphate of lime and magnesia, with sand and clay .. .. 10*s.*

„ 10.—Partial analysis of a soil, including determinations of clay, sand, organic matter, and carbonate of lime .. .. .. 10*s.*

„ 11.—Complete analysis of a soil £3

„ 12.—An analysis of oil-cake or other substance used for feeding purposes, showing the proportion of moisture, oil, mineral matter, albuminous matter, and woody fibre, as well as of starch, gum, and sugar in the aggregate; and an estimate of its value as compared with pure linseed-cake .. .. 10*s.*

„ 13.—Analysis of any vegetable product .. .. 10*s.*

„ 14.—Analysis of animal products, refuse substances used for manures, &c. .. .. from 10*s.* to £1

„ 15.—Determination of the "hardness" of a sample of water before and after boiling .. .. 5*s.*

„ 16.—Analysis of water of land-drainage, and of water used for irrigation £1

„ 17.—Analysis of water used for domestic purposes .. .. .. £1 10*s.*

„ 18.—Determination of nitric acid in a sample of water .. .. 10*s.*

„ 19.—Personal consultation with the Consulting Chemist. (The usual hours of attendance for the Director, Monday excepted, will be from 11 to 2, but to prevent disappointment, it is suggested that members desiring to hold a consultation with the Director should write to make an appointment) .. 5*s.*

„ 20.—Consultation by letter .. .. 5*s.*

„ 21.—Consultation necessitating the writing of three or more letters 10*s.*

The Laboratory of the Society is at 12, Hanover Square, London, W., to which address the Consulting Chemist, Dr. Augustus Voelcker, F.R.S., requests that all letters and parcels (postage and carriage paid) from Members of the Society, who are entitled to avail themselves of the foregoing Privileges, should be directed.

GUIDE TO THE PURCHASE OF ARTIFICIAL MANURES AND FEEDING STUFFS.

Feeding Cakes.

1. *Linseed-cake* should be purchased as "Pure," and the insertion of this word on the invoice should be insisted upon. The use of such words as "Best," "Genuine," &c., should be objected to by the purchaser.
2. *Rape-cake for feeding purposes* should be guaranteed "Pure" and purchased by sample.
3. *Decorticated Cotton-cake* should be guaranteed "Pure," and purchased by sample.
4. *Undecorticated Cotton-cake* should be guaranteed "Pure," and purchased by sample.

N.B.—All feeding cakes should be purchased in good condition, and the guarantee of the vendor should be immediately checked by a fair sample (taken out of the middle of the cake) being at once sent for examination to a competent analytical chemist. The remainder of the cake from which the sample sent for examination had been taken should be sealed up in the presence of a witness, and retained by the purchaser for reference in case of dispute.

Artificial Manures.

1. *Raw or Green Bones or Bone-dust* should be purchased as "Pure" Raw Bones guaranteed to contain not less than 45 per cent. of tribasic phosphate of lime, and to yield not less than 4 per cent. of ammonia.
2. *Boiled Bones* should be purchased as "Pure" Boiled Bones guaranteed to contain not less than 48 per cent. of tribasic phosphate of lime, and to yield not less than $1\frac{3}{4}$ per cent. of ammonia.
3. *Dissolved Bones* are made of various qualities, and are sold at various prices per ton; therefore the quality should be guaranteed, under the heads of *soluble* phosphate of lime, *insoluble* phosphate of lime, and nitrogen or its equivalent as ammonia. The purchaser should also stipulate for an allowance for each unit per cent. which the dissolved bones should be found on analysis to contain less than the guaranteed percentages of the three substances already mentioned.
4. *Mineral Superphosphates* should be guaranteed to be delivered in a sufficiently dry and powdery condition, and to contain a certain percentage of *soluble* phosphate of lime, at a certain price per unit per cent., no value to be attached to *insoluble* phosphates.
5. *Compound Artificial Manures* should be purchased in the same manner and with the same guarantees as Dissolved Bones.
6. *Nitrate of Soda* should be guaranteed by the vendor to contain from 94 to 95 per cent. of pure nitrate.
7. *Sulphate of Ammonia* should be guaranteed by the vendor to contain not less than 23 per cent. of ammonia.
8. *Peruvian Guano* should be sold under that name, and guaranteed to be in a dry and friable condition, and to contain a certain percentage of ammonia.

N.B.—Artificial manures should be guaranteed to be delivered in a sufficiently dry and powdery condition to admit of distribution by the drill. A sample for analysis should be taken, not later than three days after delivery, by emptying several bags, mixing the contents together, and filling two tins holding about half a pound each, in the presence of a witness. Both the tins should be sealed, one kept by the purchaser for reference in case of dispute, and the other forwarded to a competent analytical chemist for examination.

INSTRUCTIONS FOR SELECTING AND SENDING SAMPLES FOR ANALYSIS.

ARTIFICIAL MANURES.—Take a large handful of the manure from three or four bags, mix the whole on a large sheet of paper, breaking down with the hand any lumps present, and fold up in tinfoil, or in oil silk, about 3 oz. of the well-mixed sample, and send it to 12, HANOVER SQUARE, LONDON, W., by post: or place the mixed manure in a small wooden or tin box, which may be tied by string, but must not be sealed, and send it by post. If the manure be very wet and lumpy, a larger boxful, weighing from 10 to 12 oz., should be sent either by post or railway.

Samples not exceeding 4 oz. in weight may be sent by post, by attaching two penny postage stamps to the parcel.

Samples not exceeding 8 oz., for three postage stamps.

Samples not exceeding 12 oz., for four postage stamps.

The parcels should be addressed: DR. AUGUSTUS VOELCKER, 12, HANOVER SQUARE, LONDON, W., and the address of the sender or the number or mark of the article be stated on parcels.

The samples may be sent in covers, or in boxes, bags of linen or other materials. No parcel sent by post must exceed 12 oz. in weight, 1 foot 6 inches in length, 9 inches in width, and 6 inches in depth.

SOILS.—Have a wooden box made 6 inches long and wide, and from 9 to 12 inches deep, according to the depth of soil and subsoil of the field. Mark out in the field a space of about 12 inches square; dig round in a slanting direction a trench, so as to leave undisturbed a block of soil with its subsoil from 9 to 12 inches deep; trim this block or plan of the field to make it fit into the wooden box, invert the open box over it, press down firmly, then pass a spade under the box and lift it up, gently turn over the box, nail on the lid and send it by goods or parcel to the laboratory. The soil will then be received in the exact position in which it is found in the field.

In the case of very light, sandy, and porous soils, the wooden box may be at once inverted over the soil and forced down by pressure, and then dug out.

WATERS.—Two gallons of water are required for analysis. The water, if possible, should be sent in glass-stoppered Winchester half-gallon bottles, which are readily obtained in any chemist and druggist's shop. If Winchester bottles cannot be procured, the water may be sent in perfectly clean new stoneware spirit-jars surrounded by wickerwork. For the determination of the degree of hardness before and after boiling, only one quart wine-bottle full of water is required.

LIMESTONES, MARLS, IRONSTONES, AND OTHER MINERALS.—Whole pieces, weighing from 3 to 4 oz., should be sent enclosed in small linen bags, or wrapped in paper. Postage 2*d*., if under 4 oz.

OILCAKES.—Take a sample from the middle of the cake. To this end break a whole cake into two. Then break off a piece from the end where the two halves were joined together, and wrap it in paper, leaving the ends open, and send parcel by post. The piece should weigh from 10 to 12 oz. Postage, 4*d*. If sent by railway, one quarter or half a cake should be forwarded.

FEEDING MEALS.—About 3 oz. will be sufficient for analysis. Enclose the meal in a small linen bag. Send it by post.

On forwarding samples, separate letters should be sent to the laboratory, specifying the nature of the information required, and, if possible, the object in view.

H. M. JENKINS, *Secretary.*

Members' Botanical and Entomological Privileges.

The Council have fixed the following Rates of Charge for the examination of Plants, Seeds, and Insects for the *bonâ-fide* use of Members of the Society, who are particularly requested, when applying to the Consulting Botanist, to mention the kind of examination they require, and to quote its number in the subjoined Schedule. The charge for examination must be paid to the Consulting Botanist at the time of application, and the carriage of all parcels must be prepaid.

I. BOTANICAL.

No. 1.—A report on the purity, amount and nature of foreign materials, perfectness, and germinating power of a sample of seeds .. .. 5*s.*

„ 2.—Detailed report on the weight, purity, perfectness, and germinating power of a sample of seeds, with a special description of the weeds and other foreign materials contained in it .. .. 10*s.*

„ 3.—Determination of the species of any weed or other plant, or of any epiphyte or vegetable parasite, with a report on its habits, and the means of its extermination or prevention .. .. 5*s.*

„ 4.—Report on any disease affecting the farm crop .. .. 5*s.*

„ 5.—Determination of the species of a collection of natural grasses found in any district on one kind of soil, with a report on their habits and pasture value .. .. 10*s.*

II. ENTOMOLOGICAL.

„ 6.—Determination of the species of any insect, worm, or other animal which, in any stage of its life, injuriously affects the farm crops, with a report on its habits and suggestions as to its extermination .. .. 5*s.*

INSTRUCTIONS FOR SELECTING AND SENDING SPECIMENS.

In sending seed or corn for examination the utmost care must be taken to secure a fair and honest sample. If anything supposed to be injurious or useless exists in the corn or seed, selected samples should also be sent.

In collecting specimens of plants, the whole plant should be taken up, and the earth shaken from the roots. If possible, the plant must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel.

Specimens of diseased plants or of parasites should be forwarded as fresh as possible. Place them in a bottle, or pack them in tin-foil or oil-silk.

All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstances (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry.

N.B.—*The above Scale of Charges is not applicable in the case of Seedsmen requiring the services of the Consulting Botanist.*

Parcels or letters (Carriage or Postage prepaid) to be addressed to Mr. W. Carruthers, F.R.S., 4, Woodside Villas, Gipsy Hill, London, S.E.

H. M. JENKINS, *Secretary.*

GOVERNORS AND MEMBERS

OF THE

ROYAL AGRICULTURAL SOCIETY OF ENGLAND,

1879.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

Patroness,

HER MAJESTY THE QUEEN.

List of Governors and Members.

Life Governors and Life Members are distinguished thus †.

BEDFORDSHIRE.

Governor.

†Bedford, Duke of...Woburn Abbey

Members.

Addington, Rev. H....Henlow Grange, Biggleswade
Baker, G. W....Luton Hoo Park Office, Luton
Barnard, Edward...Bidwell Farm, Dunstable
Barnard, Thomas...Cople House, Bedford
†Barnett, George James ..Langford, Biggleswade
†Bassett, F., M.P....The Heath, Leighton Buzzard
†Blundell, Edward...Birchmore, Woburn
†Blundell, John H....Woodside, Luton
Bowick, Thomas...Bedford
Brandreth, H. C....Houghton Hall, Dunstable
Burgoyne, Sir J. M., Bt....Sutton Park, Sandy
†Campion, Rev. J. G. C...Westoning Manor, Woburn
Carlisle, Herbert, N....Markgate Street, Dunstable
Carlisle, Thomas P....Markgate Street, Dunstable
Church, George...Bedford
Clarke, William...Beach Farm, Luton
Cook, Thomas D....Brewers Hill Farm, Dunstable
Cooper, William...Foughton Regis, Dunstable
†Crawley, John S....Stockwood Park, Luton
†Duncombe, Hon. O....Waresley Park, Biggleswade
Eames, Alfred...Essington, Leighton Buzzard
Eve, John R....Silsoe, Ampthill
Fenning, H. T....Woburn
Foster, John N....Sandy Place, Sandy
Fowler, Francis...Henlow, Biggleswade
†Freeman, Frederick...Speedwell Farm, Woburn
Gillham, John...Caddington, Dunstable
Hanmer, Major W. E. Stockgrove, Leighton Buzzard
Hayward, C. Cooper...Southill, Biggleswade
Higgins, George...Castle Close, Bedford
Higgins, Colonel W. B....Picts' Hill, Bedford
†Horrell, Robert. .Oakley, Bedford
†Howard, Charles...Biddenham, Bedford
†Howard, James...Clapham Park, Bedford
†Hughes, Herbert G. S....Offley Place, Luton
Irving, W. J....Pelling Place, Old Windsor
James, John Prole...Cople, Bedford
Leigh, Mrs. Gerard...Luton Hoo Park, Luton
Lindsell, Lieut-Colonel..Fairfield House, Biggleswade
Macan, Turner A....Elstow, Bedford
Magniac, Charles...Colworth, Bedford
†Marshall, William...Gaston House, Bedford
Moulton, E. L....High Street, Bedford
†Oakley, George...Lawrence End, Luton
Phillips, Zachariah...Birchmoor, Woburn
Pressland, John...Costin Street, Bedford
Purser, Henry...Willington, Bedford
Purser, William...Cople, Bedford
†Ransome, Edwin...Kempston, Bedford
Reynolds, Matthew...Old Warden, Biggleswade
Robinson, James C....Stevington, Bedford
Robinson, Joseph...Wilshamstead, Bedford
Robinson, Thomas...Westoning, Woburn
Rogers, Alfred...Bromham, Bedford
Rogers, John...Chellington, Bedford
†Russell, Lord C., M.P....Drakelow Lodge, Woburn
†St. John, Lord...Melchbourne, Bedford
†Sebright, Sir J. G. S., Bart...Beechwood, Dunstable
Simons, T....Markyate Cell Park Farm, Dunstable
Smith, Edward...Cauldwell Villas, Bedford
Smith, Thomas...Cauldwell Street, Bedford
Squire, E. F....Silsoe, Ampthill
Stafford, Robert Barry...Bedford
Stephenson, Christopher...Woburn
Stimson, William...Marston, Ampthill
Street, George...Maulden, Ampthill
†Stuart, Lieut.-Colonel...Tempsford Hall, Sandy
†Stuart, W. D....Tempsford Hall, Sandy
Thomas, John...Bletsoe, Bedford
Thornton, Harry...Kempstone Grange, Bedford
Trethewy, Henry...Silsoe
†Trethewy, Henry, jun....Silsoe
†Vallentine,R.,Burcott Lodge Farm,Leighton Buzzard
†Walker, John...Goldington, Bedford
Winters, George...Stratton, Biggleswade
†Yeoman, G. D....Laws House, Turvey, Bedford

BERKSHIRE.

Governors.

Christian, H.R.H. Prince...Cumberland Lodge, Windsor
Craven, Earl of...Ashdown Park, Shrivenham
†Eyre, Charles...Welford, Newbury
†Lindsay, Col. R. Loyd, M P....Lockinge, Wantage
Ormathwaite, Lord...Warfield Park, Bracknell

Members.

†Adams, George...Pidwell Farm, Faringdon
Akers, Henry...Black Bourton, Faringdon
†Aldworth, Philip...Fulford, Abingdon
Allen, George...The Manor Farm, Old Windsor
†Allfrey, Major...Wokefield Park, Mortimer
Attenborough, Richard...Whilby Grove, Reading
Bailey, J. B....9, Coley Hill, Reading
Baker, Thomas...Compton, Newbury
Baker, William Henry...The Firs, Caversham
Barrett, John B....Milton House, Steventon
†Barrington, Viscount, M.P....Beckett, Shrivenham
†Bassett, Richard...Highclere, Newbury.
†Benyon, R., M.P....Englefield House, Reading
†Body, R. B....Hyde End, Shinfield, Reading
Boydell, Harry S....Sulham, Reading
†Bradshaw, Capt., R.N....Tubney Warren, Abingdon
Brebner, James...Norfolk Farm, Windsor Gt. Park
Bulkeley, T. F....Clewer Lodge, Windsor
Bulstrode, William...Mount Farm, Cookham, Maidenhead
Bunbury, Henry M....Marlston House, Newbury
†Burr, D. Higford...Aldermaston Court, Reading
Case, James...Hare Hatch Lodge, Twyford
Champion, W. Wayland....Whitley Manor, Reading
†Chapman, George...Radley, Hungerford
†Cherry, Geo. Charles...Denford House, Hungerford
Clutterbuck, Rev. J. C...Long Wittenham, Abingdon
†Coxe, James T....Newtown Farm, Hungerford
Darrell, Lionel E....The Wilderness, Reading
Davies, Jenkin...Englefield, Reading
De Mornay, Alfred...Cold Harbour, Wallingford
†De Schroder, Baron...The Dell, Windsor
†De Vitre, Rev. George Edward Denis...Keep Hatch, Wokingham
†De Vitre, H. Denis....Charlton House, Wantage
Dewe, T. W....Stone Hill, Abingdon
Downshire, Marchioness of...Easthampstead Park, Wokingham
†Druce, A. F. Milton...Fyfield, Abingdon
†Dunn, W. H....Inglewood, Hungerford
Dunning, Thomas T. W....Loddon Farm, Early, Reading
Evans, J. Russell...Burghclere, Newbury
†Ferard, E. C....Ascot Place, Windsor
Forbes, John M....Dropmore, Maidenhead
†Fox, William...Adbury, Newbury
†Franklin, Thomas...Ascott, Wallingford
†Franklin, W. Taylor...Ascott, Wallingford
†Garland, T. Bland...Hillfields, Reading
Garth, T. C....Haines Hill, Reading
Gillett, Charles...Lower Haddon, Bampton, Faringdon
Gillett, Stephen G....Kilkenny, Faringdon
†Gower, John Leveson...Bill Hill, Wokingham
Griffith, John...Heatherley, Crowthorne
Hanbury, George...Blythewood, Maidenhead
Hannam, H. J....Burcote, Abingdon
†Harper, Latimer...Chilton Cottage, Hungerford
†Hibbert, John...Braywick Lodge, Maidenhead
Hopkins, John...Tidmarsh House, Reading
†Howard, Hon. James...Hazelby, Newbury
Humfrey, Heber...Ashbury, Shrivenham
Jemmett, Alexander...Binfield, Bracknell
†Jenkins, John B...Kingstowne House, Abingdon
Kimber, James W...Fyfield Wick, Abingdon
†King, John G...Beedon, Newbury
King, J. Pittman...North Stoke, Wallingford
King, W. C....Warfield Hall, Bracknell
†Kingsmill, W. H....Sydmonton Court, Newbury
†Lane, Lieut.-Colonel...Lilly Hill, Bracknell
†Latham, Thomas...Little Wittenham, Abingdon
Lee, Captain John....Woolley Firs, Maidenhead
Lenthall, E. Kyffin...Besselsleigh Manor, Abingdon
Leven and Melville, Earl of...Windsor
Lyon, William...Arlington Manor, Newbury
Mackie, John...Reading
†Monck, J. Bligh...Coley Park, Reading
Morland, George B....Abingdon
Morley, E....Brize Norton, Bampton, Faringdon
†Morrison, Charles...Basildon Park, Reading
Morshead, Sir W., Bart....Forest Lodge, Binfield
†Mount, W. G....Wasing Place, Reading
Nalder, Thomas...Challow, Wantage
†Newman, H....Friar's Court, Clanfield, Faringdon
†Owen, Frederick J....Barton Grove, Hungerford
†Pusey, S. E. B. B....Pusey House, Faringdon
†Ratcliff, James J...The Priory, Beech Hill, Reading
Rogers, Thomas,. Rosehill, Caversham, Reading
Russell, Sir C., Bart., M.P....Swallowfield, Reading
Sawyer, Charles...Heywood Lodge, Maidenhead
Say, R. Hall...Maidenhead
†Shuter, James ..Crookham, Newbury
†Silver, Stephen W....The Benhams, Latcombe Regis, Wantage
†Simpson, Henry L....South Lea Farm, Datchet, Windsor
†Southard, Arthur...Fern Lodge, Bracknell
†Stevens, Rev. T....Bradfield Rectory, Reading
Stirton, Thomas...Benham Park-Farm, Newbury
†Sutton, M. Hope...Cintra Lodge, Reading
Sutton, Martin J....Reading
Tait, Henry...Shaw Farm, Windsor
†Thoyts, Major...Sulhamstead House, Reading
†Throckmorton, Sir W., Bt....Buckland, Faringdon
Trendell, E. J....Abingdon
Trumper, Jos....Burnham Abbey, Maidenhead
†Tucker, Henry...Bourton House, Shrivenham
†Tull, Henry...Crookham, Newbury
†Tull, Richard...Crookham, Newbury
Turner, John...Englefield, Reading
†Twinch, John...Thames Street, Windsor
Valpy, R. H....Enborne Lodge, Newbury
Vincent, William...Arborfield, Reading
Waldron, W. B....Poughley, Hungerford
Wallis, George...Old Shifford, Bampton, Faringdon

Walter, Captain E....Tangley, Wokingham
Waring, Henry...Beenham House, Reading
Wasborough, W. D....Stockham, Wantage
Waters, E. F. A.....Hollington, East Woodhay, Newbury
†Weall, William .. Pinkneys Farm, Maidenhead
Wheble, J. J....Bulmershe Court, Reading
Wilder, John, Reading
Wilkins, Edmund...Mortimer, Reading
†Williams, G....Buckland, Faringdon
†Williams, James...Shippon, Abingdon
†Wright, G. T....Stoke Farm, Wokingham

BUCKINGHAMSHIRE.

Governors.

Blount, William...Orchill, Gerrard's Cross
Carington, Lord...Wycombe Abbey
†Chesham, Lord....Latimer, Chesham
†Coleman, Edward J...Stoke Park, Slough

Members.

Beaconsfield, Earl of, K.G....Hughendon Manor
†Botham, George...Wexham Court, Slough
Bramley-Moore, J....Haughley, Gerrard's Cross
†Buckingham, Duke of...Wootten, Aylesbury
†Burton, W. S....Walton Hall, Bletchley
†Cantrell, Charles Seward...Riding Court, Datchet
†Cantrell, Henry...Bayliss Court, Slough
Carson, Captain J. S....Spinfield, Great Marlow
Carver, W. Rees..?Coln Cottage, Colnbrook
Denchfield, J....Burston, Aston Abbotts, Aylesbury
†Dent, Edward...Fernacres, Fulmer, Slough
†Drake, Thomas T....Shardloes, Amersham
†Duncombe, Sir P. P., Bt. Brickhill Manor, Bletchley
Du Pré, C. G....Wilton Park, Beaconsfield
Eley, Henry...Poyle Farm, Colnbrook
Elliman, James...Wellington Villa, Slough
Fitzroy, George...Grafton Regis, Stony Stratford
†Fountaine, Bernard T....Stoke House, Bletchley
Fowler, J. Kersley...Aylesbury
Fowler, Richard...Broughton Farm, Aylesbury
Gaskell, Major W. P....Fulmer House, Slough
Gilbey, Alfred...Wooburn House, Beaconsfield
Gurney, James jun....Chalfont St. Giles, Slough
†Guy, John Henry...Whitchurch, Aylesbury
†Harrison, R....Wolverton, Stony Stratford
Harvey, Sir R., Bart., M.P....Langley Park, Slough
†Hubbard, Egerton...Addington Manor, Winslow
Hunt, Frederick...Harmondsworth, Slough
Ive, John G....Southend Lodge, Langley, Slough
†Jegon, Trew...Slough
Kingsley, T...New Road, Alesbury
Kirbell, Edward...Latimer, Chesham
Lasenby, Frank L....Chartbridge, Chesham
Lepper, G. A....Aylesbury
†Lilley, W. S....Hardmead Manor, Newport Pagnell
Major-Lucas, Edwin...Rowsham, Aylesbury
Moore, E. W....Middle Claydon, Winslow
Morris, T. W....Bedgrove, Aylesbury
Nash, H. F....Upton Lea, Slough
Nash, John...The Rectory, Langley, Slough
†Newman, John...Brands House, High Wycombe
Newton, Alfred...Coleshill, Amersham
Norris, James...Castle Hill, Bletchingley
†Oxley, John F....Stowe, Buckingham
Paxton, Robert...Lower Winchendon, Aylesbury
†Piggott, G. Grenville...Doddershall, Winslow
Pike, William...Castlethorp, Stony Stratford
Pullin, Stephen...Mildridge Farm, Horton, Slough
Raffety, John H....High Wycombe
Reeves, Charles...Wooburn, Beaconsfield
†Roads, John...Addington, Winslow
†Robarts, A. J ...Lillingstone Dayrell
†Robinson, J....Clifton Pastures, Newport Pagnell
Rose, Sir P., Bt....Rayners, Penn
†Rowland, Richard...Creslow, Aylesbury
†Rowland, W. Rickford...Creslow, Aylesbury
Senior, Trevor L....Broughton House, Aylesbury
Shakeshaft, Thomas...Ravenstone, Olney
Silcock, Benjamin...Upton Court Farm, Slough
Simpson, John ..Potterspury, Stony Stratford
Tompson, Edward C. S....Dromenagh, Iver (Uxbridge)
Treadwell, John...Upper Winchendon, Aylesbury
†Tyringham, W. B....Tyringham, Newport Pagnell
†Tyrrell, Avery...Berkin Manor, Horton, Slough
†Verney, Sir H., Bt....Clayden House, Winslow
Vernon, Arthur...High Wycombe
†White, Thomas...Manor Farm, Dorney (Windsor)
Whiting, J. Evans...Castle Thorp, Stony Stratford
†Whiting, J. Evans....Stoke Goldington, Newport Pagnell

CAMBRIDGESHIRE.

Members.

†Ambrose, Cole...Stuntney, Ely
†Ambrose, W. C....Quy, Cambridge
Armstrong, Samuel...Shingay, Royston
†Aveling, James T....Eldernell, Whittlesey
†Babington, Professor C. C....Cambridge
Banyard, T., jun ...Poplar Hall, Horningsea
Beldam, Richard...Witchford, Isle of Ely
†Bidwell, Charles...New Barnes, Ely
Bolden, Richard...Witchford, Isle of Ely
Briggs, Thomas...Babraham, Cambridge
Brown, John...Elwyn Orchard, March
Bultitaft, H....Bedwellhay Grange, Ely
Catling, Captain R. C....Needham Hall, Wisbech
Chalk, Thomas...Linton
Cooke, Grimwood...Horsebeath Park Farm, Linton
Cooke, Mason...The Lawns, Ely
Crawley, Lewis...Inkerson, Gedney Hill, Wisbech
†Cutlack, Henry...Ely
†Cutlack, John, jun....Littleport, Ely
†Cutlack, Joseph...Ely
Derry, Charles M....Gedney, Wisbech
†Egar, Samuel...Wyrde, Thorney
Ellis, Charles...Meldreth, Royston
Ellis, Frederick...Chesterton, Cambridge

†Emson, H. H....Nether Hall, Cherry Hinton
†Fison, J. P....Teversham, Cambridge
†Fison, Samuel...Horningsea, Cambridge
Francis, Clement...Quy Hall
Frost, Captain H....West Wratting Hall, Linton
Fyson, Edward...Silverley, Ashley, Newmarket
Giddons, Wm....Walpole St. Peters, Wisbech
Grain, A. T....2, St. Andrew's Hill, Cambridge
Grain, Peter...Shelford, Cambridge
Gunnell, Thomas...Milton, Cambridge
†Hall, Herbert...Landbeach, Cambridge
Hall, W. H....Six Mile Bottom, Newmarket
†Hamond, W. Parker...Pampisford Hall, Cambridge
†Hardwicke, Earl of...Wimpole
Holben, R. Rowley...Barton, Cambridge
†Houblon, R. Archer...Bartlow, Cambridge
Huddleston, F....Sawston Hall, Cambridge
Humphrey, A....Walpole St. Peter, Wisbech
†Hunt, John...Manor Farm, Coton, Cambridge
Hurrell, Henry...Madingley Hall, Cambridge
Hurrell, William....Newton, Cambridge
†Ivatt, Charles E....Rampton, Cambridge
Jennings, Thomas...Phantom House, Newmarket
†Johnson, Thomas...Whittlesea
†Jonas, George...Ickleton (Saffron Walden)
Jonas, John Carter...3, St. Mary Street, Cambridge
Jones, Henry...Apeshall House, Littleport
Jones, John C....Stonea Grange, Wimblington, March
King, Edmund...Ashley Hall, Newmarket
†Lambert, Henry...Great Abington, Cambridge
†Linton, John...Westwick Hall, Cambridge
†Little, H. J....Coldham Hall, Wisbech
Little, James L....The Plains, Littleport, Ely
†Little, W....Littleport, Ely
Little, W. Cutlack...Stag's Holt, March
†Long, Hanslip...Shippen Hill, Ely
†Loomes, Edward...Whittlesea
†Martin, Joseph...Littleport, Isle of Ely
Maynard, Robert...Whittlesford, Cambridge
Moore, William...Elm House, Elm, Wisbech
Moulton, Joseph...High Street, Chatteris
Moyes, A. H....21, Petty Curry, Cambridge
†Pate, Martin...Ely
Pearce, Charles...Thorney
†Phypers, A....Long Stanton, Cambridge
Purkis, William...Horseheath, Linton
Ratliff, W....Newmarket
Roads, John....Foxton Bury, Royston
Robins, G. F....Isleham, Soham
Rowton, William...Cambridge
Rush, Thomas...Babraham, Cambridge
Russell, G. E....Walpole St. Peter, Wisbech
Sell, C....Bassingbourne, Royston
†Silcock, Edward C....Wood House, Chettisham, Ely
†Slack, Alfred...Soham, Ely
Slater, S. Webb...Ditton Lodge, Newmarket
†Staffurth, W. A. Ellis...Whittlesea
Stephenson, Robert...Burwell, Cambridge
Towgood, Hamer...Little Shelford
†Vipan, T. Maylin...Sutton, Ely
Watson, Frederick...Lynwood, March
Webb, H ...Streetly Hall, West Wickham, Linton
Webb, Samuel...Babraham, Cambridge
†Woodham, W. Nash...Shepreth, Melbourne
Wright, Charles...Streatham, Ely
Yorke, Hon. Eliot T....Wimpole, Arrington
Yorke, James N....Newmarket

CHESHIRE.

Governors.

†Davies, David Reynolds...Agden Hall, Lymm
Legh, W. John, M.P....Lyme Park, Disley, Stockport
Westminster, Duke of, K.G...Eaton Hall, Chester

Members.

Alcock, John...Pulford (Wrexham)
Andrews, Samuel...Hale Mound, Altrincham
Armitstead, Rev. John L....The Vicarage, Sandbach
Armstrong, J. Knight...Wharton Hall, Winsford
Ashton, Edmund...Abbey Field, Sandbach
†Balstone, Henry K....Hale Carr, Altrincham
†Barbour, George...Bankhead, Broxton, Chester
†Barbour, R....Bolesworth Castle, Chester
Barton, Richard...Caldy Manor, Birkenhead
†Beatty, D. L....Cherry Hill, Malpas
Beckett, Richard...Hartford, Northwich
Beckett, Samuel...Eccleston, Chester
Bell, Henry...Hempshaw Brook Brewery, Stockport
Bennett, David...Marsh Gate, Norton, Runcorn
Bentley, Timothy...Davenham, Northwich
Beswick, William...Arley, Northwich
Billington, John S....Balterley Hall, Crewe
Birchall, Edward, Wellastone, Nantwich
Booth, John...Haslington, Crewe
Bowers, J. Arthur...Occlestone, Middlewich
Brady, Charles Alldis...Adswood, Stockport
Brady, W. Hollinshed...Chestergate, Stockport
Bratherton, George...Bradwall, Sandbach
Brooks, J. Marshall...Portal, Tarporley
Broughton, E. Delves...Wistaston Hall, Nantwich
Burgess, B....Weaverham, Northwich
Burn, R. Scott...Edgeley Road, Stockport
Byrd, David...Spurston Hall, Tarporley
Callender, Peter...Devonshire House, Birkenhead
†Carter, George John...Tatton Dale, Knutsford
†Case, J. B....Poulton Hey, Bebbington, Birkenhead
Cawley, Thomas...Nantwich
Cholmondely, Col. Hon. G...Abbots Moss, Northwich
†Cholmondeley, Marquis of...Cholmondeley Castle, Nantwich
†Churton, John...Foregate Street, Chester
Clarke, John...Broadland, Nantwich
Cliffe, Joseph...Whitley Hall, Northwich
Cliffe, Thomas...Crewe Gates, Crewe
†Combermere, Viscount....Combermere Abbey, Nantwich
Cooke, John...Mill Moor, Macefen, Malpas
Corner, John...Hurlestone, Nantwich
Cossins, John...Landway, Northwich
†Cox, Henry...Bromborough, Birkenhead
Daine, Thomas...Hale, Altrincham

Dale, John...Chelford, Crewe
Danson, J. T....Green Fields, Little Sutton, Chester
Davenport, John...Bollington Mill, Altrincham
Davenport, W. Bromley...Copesthorne, Congleton
Davies, C. B....Eardswick Hall, Middlewich
†Davies, James...Bollington, Altrincham
Davies, Thomas...Overpool, Suton, Chester
Dean, James...Betley, Crewe
Dickson, Arthur...Queen's Park, Chester
†Dickson, G. A....Newton Nurseries, Chester
Dixon, Captain G....Astle Hall, Chelford, Crewe
Dobell, Joseph...Leftwich, Northwich
†Done, Thomas F....Bickley Hall, Malpas
Donnell, Joseph...Tarvin Sands, Chester
Dutton, John R....Great Sanghall, Chester
Egerton, Lord...Tatton Park, Knutsford
Egerton, Sir P. de Malpas G., Bt., M.P...Oulton Park, Tarporley
Egerton, Hon. Wilbraham, M.P...Rostherne Manor, Knutsford
†Fair, William...Aston by Budworth, Northwich
Fearnall, Richard...Lea, Aldford, Chester
Fitton, Samuel...Willastone, Nantwich
Foden, Edwin...Sandbach
Forwood, T. P....Thornton Manor, Neston
France-Hayhurst, Colonel...Bostock Hall, Middlewich
†Frost, Robert...Lime Grove, Chester
Gardner, W. A...Hough Green, Chester
Gilbert, John H....Ashton-on-Mersey, Sale
Goodwin, I. A....Henhull Farm, Nantwich
Goose, Daniel, jun....Kinnerton, Chester
Greenwood, William ..Dunham Massey, Altrincham
†Gregson, S. Leigh...Overton Hall, Malpas
Grey, Edward...Eastham, Birkenhead
Griffiths, R. C....Park Farm, Hawarden
Gruning, Louis....Broomborough, Chester
Hague, James...Gawsworth, Macclesfield
Hall, Edward...Horwich House, Whaley Bridge, Stockport
Harkes, David...Mere, Knutsford
Harrison, T. Ashton...Stalybridge
Hayes, William...Frodsham, Preston Brook
Heath, Thomas...Withymore Farm, Burleydam
Heywood, W. H ...Dunham Massey, Altrincham
Highfield, John...Fransley House, Seven Oaks, Northwich
†Hobson, Thomas...Pownall Hall, Wilmslow
Hodson, Henry...Edleston Farm, Nantwich
Hoggins, T....Trafford Lodge, Chester
Holland, R...Norton Hall, Hulton, Runcorn
Holland, William...Broxton, Chester
Hornby, W. H....Poole Hall, Nantwich
Howard, Samuel...Dunham Massey, Altrincham
Hurst, Thomas...Tabley, Knutsford
Jackson, George...Higher Peover, Knutsford
Jackson, T. F....Tattenhall Hall, Chester
Jackson, W. Turner...Noctorum, Birkenhead
†Jocelyn-Ffoulkes, Major..11, Stanley Place, Chester
Johnson, Thomas...Bache Hurst, Chester
Johnson, T....Wyehough, Malpas
Jones, James...The Oaklands, Spurston, Tarporley
Kay, Christopher...Davenham Hall, Northwich
Kay, James...Warburton, Lymm
Kirby, Thomas...Elton Cottage, Sandbach
Latham, G. W....Bradwall Hall, Sandbach
Lea, John...Stapleford Hall, Chester
Leather, Simeon...Delamere, Northwich
Legh, G. Cornwall...High Legh Hall, Knutsford
†Leigh, Capt. Egerton..The West Hall, High Leigh, Knutsford
†Lewis, George...The Bank, Malpas
Leycester, R. O....Toft Hall, Knutsford
Lockwood, A. Carden...Chester
Lowe, John...Wheelock Heath, Sandbach
Lowe, Thomas...Calverley Hall, Handley, Chester
MacGregor, Alexander...Eaton Road, Chester
Macgregor, John...Acton, Weaverham, Northwich
MacGregor, Paul M....Ouston, Weaverham
McHattie, John...Chester
Monk, Thomas...Wallasey, Birkenhead
Mousley, Capt. George.. Hooton Hall, Chester
Myott, James...Capesthorne, Crewe
†Naylor, R. C....Hooton Hall, Chester
Newhouse, Henry...Tatton Park, Knutsford
Newton, Martin...Oldfield, Altrincham
Nicholson, Robert, jun....Blacon Point, Chester
Noden, Joseph...Bridgmere Hall, Nantwich
Oswell, E. F....Hampton Hall, Malpas
Parker, Edmund...Stretton, Malpas
Parker, Thomas...Churton House, Churton
†Parker, Thomas...Churton Hall, Chester
Parker, William...Great Stanney Hall, Chester
Parrott, T....Green Bank, Sutton, Macclesfield
Pickering, J....Pool Hall, Sutton, Chester
Potts, Charles William...Heron Bridge, Chester
Reilly, Owen...1, Abbey Green, Chester
Rigby, Thomas...Frodsham Bridge, Preston Brook
Roberts, John...Well House, Saltney, Chester
Roberts, Robert...The Firs, Chester
Roberts, T. Q....82, Westergate Street, Chester
Rodger, George...Arden House, Altrincham
†Shallcross, Thos. R....Capenhurst Grange, Chester
Shepherd, William...Woodhouse, Aldford, Chester
Sherwin, Charles...Tabley, Knutsford
Shuker, William...Calverley, Tarporley
Siddeley, John...Spring Bank, Altrincham
Siddorn, Henry...Rushton, Tarporley
Slater, Cyrus...Dunkirk, Holmes Chapel
Smith, Thomas...Mollington Farm, Chester
†Smyth, H. L....Crabwell Hall, Chester
†Snow, T. Owen...Lack Hall, Chester
Speakman, Thomas...Doddington Park, Nantwich
†Sykes, E. H....Edgeley, Stockport
Tabley, Lord de...Tabley House, Knutsford
Thompson, E. J....Timperley, Altrincham
Thompson, Henry...Organsdale, Kelsall, Chester
†Tollemache, John...Tilston Lodge, Tarporley
Tonge, James C....New Hall, Neston
†Torr, John, M.P...Carlett Park, Eastham
Townshend, Charles...Chester
Vernon, William...Tarporley
†Viggars, Henry...Lealand, Chester
†Walkden, Thomas...Mellington, Altrincham
†Walkden, William...Carrington Hall, Sale
Walker, Joseph...Chorlton, Nantwich
Walley, John...Mere House, Baddiley, Nantwich

Wallworth, Joseph...White Hall, Wilmslow
Walsh, Zaccheus...The Park, Wilmslow
Warburton, G. E....Arley Hall, Northwich
Warburton, Rowland E. E...Arley Hall, Northwich
†Watterson, W. C....Bowdon, Altrincham
†Wheler, E. G....High Legh, Knutsford
Whittingham, John...The Cross, Nantwich
Wiggins, Henry...Sealand, Chester
Wilbraham, Randle...Rode Hall, Lawton
Williams, J. R....Harewood Hall, Kelsall, Chester
†Williams, William...Blacon House, Chester
Wolff, Charles H....The Clough, Hale, Altrincham
Wright, James...Cop House Farm, Saltney, Chester
†Wright, Thomas...Claremont, Spital, Birkenhead

CORNWALL.

Governor.

Robartes, Lord...Lanhydrock House, Bodmin

Members.

Anderton, E. D....Oakroyd, Falmouth
†Barton, Rev. H. N....St. Ervan Rectory, Padstow
Bassett, G. L....Tehidy, Camborne
Bishop, James...Bobcarn, Looe
†Bolden, J. L....Tehidy, Camborne
†Bolitho, Edward...Trewiden, Penzance
†Bolitho, T. S....Pendleverne, Penzance
†Bolitho, William...Penzance
Brenton, William...Polbathic, St. Germans
Clark, William...Luney Barton, St. Ewe
Coryton, Augustus...Pentillie Castle, Saltash
†Daubuz, John Claude...Killion, Truro
†Davey, J. S....Bochym House, Helstone
Davey, Richard...Bochym House, Helstone
Davies, J. C....Tregonan, St. Ewe, St. Austle
Fortescue, Capt. Cyril D....Boconnock, Lostwithiel
Glanville, Reginald C....Sconnor, St. Germans
Grose, Wesley R....Penpont, Wadebridge
Hoblyn, W. P....The Fir Hill, St. Columb
Hockin, John...Broomhill, Stratton
Hosken, Samuel...Loggan Mill, Hayle
Jenkyns, A....Charlestown, St. Austle
Julyan, Richard...Gargass, Grampound
†Lobb, George...Lawhitton, Launceston
†Marshall, Rev. E. H....The Rectory, Launceston
Marshall, R. H....Trenoon, St. Mawgan, St. Columb
Matthews, R., jun....Tregoose, Helston
†Neame, H. B....The Brewery, Ruthin
Olver, R. Sobey...Trescowe, Bodmin
†Paige, W. P....Pathada, Menhenist, Liskeard
†Pinwall, Captain...Trehane, Probus
Rashleigh, J....Menabilly, Par Station
†Rodd, F....Trebartha Hall, Launceston
†Rogers, John J....Penrose, Helstone
Rosewarne, John...Nanpusker, Hayle
Stephens, W. W. Wesley...Hendra, St. Kew, Wadebridge
Tregaskis, S. T....Blabel, St. Issey
Tremain, James.....Tregony, Grampound
Tremaine, Wm....Polsue House, Grampound
†Tremayne, John, M.P....Heligan, St. Austle
Trethewy, W....Tregoose, Grampound Road
†Tyacke, John...Merthen, Falmouth
Venning, John...Treblethick, St. Mabyn, Bodmin
†Vivian, A. Pendarves, M.P..St. Anthony, Grampound
†Vivian, H. H....Tregavethan, Truro
Vivian, J. A....Penbole, St. Kew, Wadebridge
Williams, Henry...Alma, Truro
†Willyames, E. B. ...Nanskeval, St. Columb

CUMBERLAND.

Members.

Alexander, W. L....Oak Hill, Lorton, Cockermouth
Allison, Robert A....Scaleby Hall, Carlisle
Anderson, W...Houghton, Carlisle
†Atkinson, James...Winderwath, Penrith
†Banks, Edwin H....Highmoor House, Wigton
Barton, Thomas...The Crescent, Carlisle
Bell, George J....Nook, Irthington, Brampton
†Bell, John...Scale Hall, Lazonby, Penrith
†Bell, Robert...Mealsgate, Brampton
Birkett, Joseph...Foxton House, Penrith
Blackstock, A. D....Hayton Castle, Maryport.
Borthwick, William...Monkwray, Whitehaven
†Boustead, John...Armathwaite, Cockermouth
Bowstead, James Cooper...Hackthorpe Hall, Penrith
Bowstead, T....Eden Hall, Penrith
†Bridson, Joseph R....Belle Isle, Windermere
†Briscoe, Sir Robert, Bart....Crofton Hall, Wigton
Brown, Matthew...Scarbank, Longtown
†Burnyeat, W., jun....Corkickle
†Caddy, Henry...Rougholm, Bootle
†Carruthers, R. B....Guards Mill, Gretna
Cousins, Richard...Whitehaven
Cumpston, Joseph H....Barton Hall, Penrith
†Dacre, Rev. William...Irthington Vicarage, Carlisle
Dalton, Pattinson...Cummersdale, Carlisle
Dalzell, Anthony...Stainburn Hall; Workington
Dalzell, John...Papcastle, Cockermouth
†Dent, Wilkinson. Flass House, Kirkby Thore, Penrith
Donald, J. H....Thursby, Carlisle
†Fell, A. L....Knolls, Carlisle
Fell, Rev. J. A....Knolls, Carlisle
†Fisher, Captain C....Distington House, Whitehaven
†Fisher, Peter...Wetheral Abbey, Carlisle
†Fletcher, Capt. Joseph...Lowther St., Whitehaven
†Foster, S. P....Killhow, Mealsgate, Carlisle
†Foster, William...Westward Park, Wigton
†Fox, William...Abbey, St. Bees
Gibbons, Thomas.. Chiswick Street, Carlisle
Gibson, Robert...Ellerbeck, Penrith
Graham, James...Parcelstown, Longtown
Graham, William...Hawksdale, Carlisle
†Grainger, Francis...Fir Tree Bank, Abbey Town
Gunson, John..Ponsonby, Calder Bridge, Whitehaven
Hayton, Pattinson...4, Lonsdale Street, Carlisle
†Heskett, John...Plumpton Hall, Penrith
Heskett, William...Plumpton Hall, Penrith
Highfield, George...Blencogo House, Wigton

Hindmarsh, Charles...17, Bridge Street, Workington
Hogarth, John...Julian Bower, Penrith
†Hope, Joseph...Whoof House, Carlisle
Howard, Hon. C. W. G., M.P....Naworth Castle, Brampton
†Howard, Henry C....Greystoke Castle. Penrith
†Hudson, James...St. Andrews Place, Penrith
Hutchinson, John...Brougham Castle, Penrith
†Jackson, William...Oak Bank, Carlisle
†James, Captain W. E....Barrock Lodge, Carlisle
†Jefferson, Robert...Preston Hows, Whitehaven
Jefferson, Skelton...Preston Hows, Whitehaven
Jenkinson, Wilson...The Schoose Farm, Workington
Johnson, George J....Castlesleads, Brampton
Lawson, Sir Wilfrid, Bart., M.P...Brayton, Aspatria
†Lawson, W....West Street, Wigton, Carlisle
Leathes, William...Lampleugh Hall, Cockermouth
†Little, James...Fauld, Longtown
Moffat, James...Kirklinton Park, Carlisle
Montgomery, J. W....New Lowther Street, Whitehaven
†Musgrave, Sir R. C., Bart....Edenhall, Penrith
†Nicholson, James...Blencairn Hall, Penrith
Norman, William...Hall Bank, Aspatria
Oliphant-Ferguson, G.H. H..Broadfield House, Carlisle
Parker, Francis...Acorn Bank, Penrith
†Parker, T. Holme...Warwick Hall, Carlisle
†Parker, William...Carlton Hill, Penrith
Parkin, William...Blaithwaite House, Aspatria
Railton, Henry...Mealsgate, Carlisle
†Richardson, John...The Oaks, Dalston, Carlisle
†Bigg, Hugh C....Crossrigg Hall, Penrith
Rigg, Lieut.-Col. H....Crossrigg Hall, Penrith
Robertson, J....33, Queen Street, Whitehaven
Ross, John...The Grove, Ravensglass
†Salkeld, Thomas...Holme Hill, Carlisle
Sanderson, Lieut.-Col....Eden Lacey, Penrith
†Saunders, C. R....Nunwick Hall, Penrith
Scott, Jonathan...Little Crosthwaite, Keswick
†Smith, George...The Luhan, Penrith
†Spedding, John J....Greta Bank, Keswick
†Stanley, William...Ponsonby Hall, Whitehaven
Sweeten, B. T....Ashgrove, Penrith
†Taylor, John...Burnfoot House, Wigton
Thomlinson, John...Armathwaite Castle, Carlisle
†Thompson, Anthony...Cross, Whitehaven
Thompson, Henry...Aspatria, Carlisle
†Thompson, Robert...Inglewood Bank, Penrith
Thompson, Thomas C....Milton Hall, Brampton
†Todd, John...Mireside, Wigton, Aspatria
Toppin, J. C....Musgrave Hall, Skelton, Penrith
Vane, Sir H. R., Bart....Hutton Hall, Penrith
†Varty, Thomas...Stag Stones, Penrith
Walker, Henry...Seilafield (Carnforth)
Waugh, Edward...Cockermouth
†Wilson, John...Fairfield, Lorton, Cockermouth
Wilson, Joseph...Penrith
Wilson, W. F....The Gale, Abbey Town, Carlisle
†Winn, W. Fothergill...Bower Bank, Penrith
†Wood, George...Wetherall, Carlisle

DERBYSHIRE.

Governors.

†Belper, Lord...Kingston Hall, Derby
Evans, Thomas William, M.P....Allestree Hall, Derby
†Heywood, Sir T. Percival, Bt...Doveleys, Ashbourne
†Vernon, Lord...Sudbury Hall, Derby

Members.

†Arkwright, Frederic C....Wellersley, Cromford, Derby
†Arkwright, William..Sutton Scarsdale, Chesterfield
Ault, William...The Mount, Quorndon, Derby
Bakewell, Charles Henry...Quorndon, Derby
Barron, J....Borrowash, Derby
†Barrow, B. L....Sydnope Hall, Matlock
Blackwall, J. B. Evans...Biggin House, Wirksworth
Blackwell, Richard...Nottingham Road, Derby
†Bland, Henry Wainwright...Barlow, Chesterfield
†Blathwayt, R. W....Barker Fields, Derby
†Boam, Henry...Litchurch Villa, Derby
†Boden, Henry...The Friary, Derby
†Boden, Walter...Gower Street, Derby
Bott, Richard...Church Broughton, Derby
†Bower, T. W,..Woodthorpe, Norbriggs, Chesterfield
Bradshaw, Francis, jun....Barton Blount, Derby
†Briggs, William...Melbourne, Derby
Brownson, John..Hollyhurst, Marston Montgomery, Ashbourne
Campbell, Colin M., M.P....Woodseat, Ashbourne
Cannor, Edwin...Stanley Grange, Derby
Carrington, Thomas...Osmaston, Derby
†Carrington, T. S. T....Eaton, Doveridge, Derby
Chandos-Pole-Gell, H. ..Hopton Hall, Wirksworth
Chandos-Pole, Reginald...Radburne Hall, Derby
Clark, William...59, Traffic Street, Derby
†Coke, Hon. E. K....Longford Hall, Derby
Coleman, John...Park Nook, Quorndon, Derby
Colvile, C. R....Lullington Hall (Burton-on-Trent)
Cooke, Henry...Edgemoor, Buxton
Copestake, T. G....Kirk Langley, Derby
Corbett, George...Derby
Cottingham, John G....Chatsworth, Chesterfield
Cowley, T. M....Broad Vale, Derby
Cox, Samuel Walker...Spondon Cottage, Derby
Cox, Walter H....Woodside, Bolsover, Chesterfield
Cox, William...Brailsford, Derby
Crawshaw, R. W....The Hagge, Chesterfield
Crewe, Sir J. H., Bart....Calke Abbey, Derby
Crompton, George...Chesterfield
Crompton, John George...Derby
†Curzon, N. C....Lockington, Derby
De Rodes, W. H....Barlborough Hall, Chesterfield
†Dixon, George M....Bradley Hall, Ashbourne
†Drewry, Frank...Buxton
Edge, B....Ash Farm, Etwall, Derby
Eite, John...Allestree, Derby
Etches, Edward...Derby
Fawkes, Algernon...Derby
†Feilden, Robert...Coxbench, Derby
Finney, Charles...The Smerills, Derby
Fox, Frederick F....Melbourne, Derby
†Frank, R. H....Ashbourn Hall, Ashbourne

†Gardom, T. W....The Yeld, Baslow, Chesterfield
†Garland, Edgar C....Little Eaton, Derby
Gilman, William...Lulwall, Hartington, Ashbourne
Greaves, William...Bakewell
Grimes, H. W....Scarcliffe Grange, Chesterfield
Hall, Lorenzo K....Holly Bush, Sudbury, Derby
Hall, Richard...Thulston, Derby
Harris, John...Cromford Bridge House, Matlock
Harris, Walter...Noel, Crich
Harrison, John, jun....Snelston Hall, Ashbourne
Harrison, W. H....Church Mayfield, Ashbourne
Haywood, James...Littleover, Derby
Heywood, Arthur P....Duffield Bank, Derby
Hickman, Thomas P...The Grange, Quorndon, Derby
†Hubbersty, A. C....The Ford, Alfreton
Hubbersty, Henry A....Buxton
Hubbersty, William P....Wirksworth
Hurt, Albert F....Alderwasley, Belper
Jowett, Christopher...Palterton, Chesterfield
Knight, A. H....Bradley Pastures, Ashbourne
Knight, Thomas...Cauldwell (Burton-on-Trent)
Leacroft, Rev. C. H....Brackenfield, Alfreton
†Lister, Charles...Darley Dale Abbey, Matlock
†Lucas, Bernard...Chesterfield
†Markham, C....Tapton House, Chesterfield
Martin, John T....Corn Market, Derby
Mayer, William...Chaddesden, Derby
Mawson, Samuel W....West Broughton, Sudbury, Derby
Meynell, F. W....Coxbench Hall, Derby
†Meynell, Godfrey...Meynell Langley, Derby
Morewood, Charles R. P....Alfreton Hall
Morley, John...Spondon, Derby
†Mundy, E. Miller...Shipley, Derby
Mundy, F. N....Markheaton Hall, Derby
Murray, Gilbert...Elvaston Castle, Derby
Nesfield, R. M. N....Castle Hill, Bakewell
Newton, Charles E....Mickleover, Derby
Nuttall, James...Ashbourne
Oakes, T. H....Riddings House, Alfreton
Parkin, John...Idridgehay, Derby
Phillips, J. E....Derby
Porter, William...Brundsell Hill Top, Derby
†Pountain, Major...Cowsley House, Derby
†Prince, John...Foston Hall Farm, Derby
Radford, C. C....Tansley Wood, Matlock
Radford, Thomas S....Church Broughton, Derby
Radford, Vaughan H....Campfield Hall, Alfreton
†Renshaw, H. C....Chapel-en-le-Frith
Scarsdale, Lord...Kedleston Hall, Derby
Shaw, John...College Place, All Saints, Derby
†Sheldon, J. P....The Brund, Sheen, Ashbourne
Simpson, George....Mayfield House, Ashbourne
Sitwell, R. S....Merley, Derby
Smith, F. N....Winfield Park, Ripley
Smith, Rowland...Duffield Hall, Derby
†Smith, Sydney...Burnt Leys, Whitwell, Chesterfield
Strelly, R. C....Oakerthorpe, Alfreton
†Strutt, Hon. Frederick...Milford House, Derby
Swaffield, Clement...Bakewell
Taylor, Thomas...Hopton, Wirksworth
Thomson, John...Melbourne, Derby
†Thornhill, W. Pole...Stanton Hall, Bakewell
Tomlinson, Arthur...Stenson House, Derby
Tomlinson, Frederick...Southwood, Ticknall, Derby
†Tomlinson, Thomas...The Pastures, Bradley, Ashbourne
†Turbutt, Wm. G....Ogston Hall, Alfreton
Wade, Samuel...Mickleover, Derby
Waite, Richard...Duffield, Derby
Walker, Matthew...Chaddesden, Derby
Walton, John A....Lockington, Derby
Walthall, Henry W....Alton Manor, Derby
†Waterpark, Lord...Doveridge Hall, Derby
Webster, G. P....Oxcroft, Bolsover, Chesterfield
†Wood, John...Spondon, Derby
†Wood, John B....The Hall, Wirksworth
Wood, Philip...Derwent Street, Derby
Woolley, Joseph...Allestree Hall, Derby
Wright, Frank...Hill Top Farm, Ashbourne
Wright, John...Osmaston Manor, Derby

DEVONSHIRE.

Governors.

Acland, Sir T. Dyke, Bt., M.P...Sprydoncote, Exeter
†Fortescue, Earl...Castle Hill, South Molton

Members.

†Acland, C. T. Dyke...Sprydoncote, Exeter
†Amory, Sir J. H. Heathcote, Bt., M.P...Knightshays Court, Tiverton
†Baillie, Evan...Filleigh, Chudleigh
†Baker, Robert N. G....Heavitree, Exeter
Barrow, W....Hollowmead, Bishopsteignton, Teignmouth
Battams, G. B....Kilworthy, Tavistock
Bayly, John...Plymouth
Bayly, Robert...Torr Grove, Plymouth
†Beedle, Thomas...Southwood, Tiverton
†Bell, J. Askew...East Budleigh, Salterton
Bennett, E. Gasking...Plymouth
Benson, John...Uplands, Exeter
Besley, Henry...South Street, Exeter
†Boger, Hext...Lower Durnford Street, Stonehouse
Bremridge, J. L....Whiddon Down, Okehampton
Brown, George...Roborough House, Barnstaple
Buller, Major C. B....Downes, Crediton
†Bulteel, John...Pamflete, Ivybridge
Burnard, Charles F....Compton Villa, Plymouth
†Calmady, Vincent P....Tetcott, Holsworthy
†Carew, Thomas...Collipriest House, Tiverton
†Carew, W. H. Pole...Antony House, Devonport
†Carpenter-Garnier, J., M.P...S. Sydenham, Tavistock
Churchill, H....Barton House, Morchard Bishop
Clark, Henry...Efford Manor, Plymouth
Cleave, Benjamin W....Newcombe House, Crediton
†Clinton, Lord...Heanton Satchville, Beaford
Collier, W. F....Woodtown, Horrabridge
†Collins, John...Wonham, Bampton
Cornish, John F....Stancombe, Kingsbridge
Davie, Sir H. Ferguson, Bt., M.P....Creedy, Crediton
†Davy, J. Tanner...Barton Roseash, South Molton
Devon County Agricultural Society, Secretary of

†Devon, Earl of...Powderham Castle, Exeter
Divett, John...Bovey Tracey
Drew, James...Artiscombe, Tavistock
†Duckworth, Sir J., Bart....Wear House, Exeter
Durant, H. W....North Tawton
Durant, Richard...Sharpham, Totnes
Eccles, H. J....Hareston, Plympton
Elliott, Samuel...Trafalgar House, Plymouth
Elton, Sir E. M., Bart....Widworthy Court, Honiton
Exeter, The Bishop of...The Palace, Exeter
Follet, Charles John...Exeter
Ford, Charles T....Stoke Canon, Exeter
Franklin, Joseph H....Huxham, Exeter
†Gamlen, W. H....Brampford Speke, Exeter
†Garratt, John...Bishops Court, Exeter
Gordon, Charles...Wiscombe Park, Honiton
Gould, Albert E....Poltimore, Exeter
Grainger, Rev. G. W... Luppitt Vicarage, Honiton
Hamlyn, S. C....Leawood, Bridestowe
Harris, W. J....Halwill Manor, Highampton
Hole, William...Winham, Cullompton
†Huyshe, Rev. John...Clysthydon, Cullompton
†Johnson, John G....Cross House, Torrington
†Karslake, Rev. W. H....Mesham, South Molton
†Kennaway, Sir John H., Bt., M.P....Escot, Ottery St. Mary
Kitson, William...Torquay
Knapman, John...South Tawton, Okehampton
Lake, John...Edgeworthy, Morchard, Tiverton
Langdon, Mrs....Flitton Barton, North Molton
†Lopes, Sir Massey, Bt., M.P...Maristow, Roborough
†Maconchy, John A....Corrinagh, Torquay
†Marker, Richard...Combe, Honiton
†Martin, Gilson...Bedford Office, Tavistock
†Meller, Alfred...Otterhead, Honiton
†Miles, William...Dix's Field, Exeter
Milford, Frank P....Haldon, Kenn, Exeter
Milford, Thomas...Thorverton, Cullompton
Morley, Earl of...Saltram, Plympton
Mount Edgecumbe, Earl of..Mt Edgecumbe, Devonport
Norman, G....Dinnaton, Swimbridge, Barnstaple
Norrington, Charles...Catte Down, Plymouth
Norris, Charles...Motion Barton, Exeter
†Northcote, Rt. Hon. Sir S. Bt., M.P..Pynes, Exeter
Osmond, Edwd...Woodrow, Brampford Speke, Exeter
Palmer, Roger...Beaworthy, Exbourne
Perry, William...Alder, Lewdown
Phillips, Thomas...5, Princess Square, Plymouth
Pidgeon, Hubert H....Great Torrington
Poltimore, Lord...Poltimore Park, Exeter
Porter, William...Hembury Fort, Honiton
†Portsmouth, Earl of...Eggesford House
Potter, T., jun....Thorverton, Cullompton
†Proby, Rev. W. H. B....Colyton House, Axminster
†Radcliffe, C. Lopes...Derriford, Tamerton Foliott
Radmore, G....Court Barton, Thorverton
Riddell, Major-General...Oaklands, Chudleigh
Ridgway, Lieut.-Col. A....Blackanton, Totnes
Sanders, E. A....Stoke House, Exeter
†Sanders, F. W. A....Pilton, Pinhoe, Exeter
Scarborough, E. I....Colyford, Colyton
†Scratton, D. R....Ogwell, Newton Abbott
Shepheard, Joseph...Torpoint, Devonport
Smith, William...Whimple, Exeter
Spearing, John B....Maristow Cottage, Roborough
Spragge, F. H....Paignton
†Stevens, J. C. Moore...Winscott, Torrington
†Stowey, Augustus...Kenbury House, Exeter
†Strode, Major..Newnham Park, Plympton St. Mary
†Tanner, J. M....King's Nympton Park, Chumleigh
Tanton, E....Hill Farm, Torrington
†Troyte, C. A. W....Huntsham Court, Bampton
Turner, George...Great Bowley, Tiverton
Vellacott, W. H....Pristacott, Barnstaple
Walrond, J. Walrond...Broadfield, Cullompton
Walrond, Captain W. H....New Court, Topsham
Ward, Samuel...St. David's, Exeter
Watson, R. H....Brook, Totnes
†Webber, Charles H....Buckland, Barnstaple
†West, R. Thornton...Streatham Hall, Exeter
Williams, C. H....Pilton House, Barnstaple
Wills, John...Pengellys, Exeter
Wippell, Henry...Barton, Alphington, Exeter
Wroth, Edward...Bigbury Court, Ivybridge
†Wyndham, J. Evelyn...Exmouth

DORSETSHIRE.

Governors.

Ilchester, Earl of...Melbury, Dorchester
†Portman, Viscount...Bryanston House, Blandford

Members.

Alington, Lord...Crichel, Wimborne
†Baker, Sir E. Baker, Bt...Ranston House, Blandford
Benjafield, N....Motcombe, Shaftesbury
Bennett, Stephen White...Wareham
†Bryant, Benjamin...Berwick, Bridport
Buckman, Professor...Bradford Abbas, Sherborne
Burt, George...Purbeck House, Swanage
†Burt, H. C....Witchampton, Wimborne
†Calcraft, J. H....Kempstone, Corfe Castle
Chick, John...Compton Vallence
Chick, Thomas...Stratton, Dorchester
Crane, James...Tolpuddle, Dorchester
Cross, W. jun....Minterne Magna, Cerne, Dorchester
Digby, G. D. Wingfield...Sherborne Castle
Digby, Lord...Minterne House, Dorchester
Dowden, Thomas...Roke Farm, Bere Regis
†Drax, J. S. W. Erle, M.P...Holnest House, Sherborne
†Eddison, Francis...Martinstown, Dorchester
†Evans, W. Herbert...Ford Abbey (Chard)
†Farrer, O. C....Binnegar Hall, Wareham
†Farrer, O. W....Binnegar Hall, Wareham
†Floyer, John, M.P....Stafford, Dorchester
Fookes, Henry...Whitechurch Farm, Blandford
Ford, John...Rushton Farm, Blandford
Frampton, Henry...Okers Wood, Dorchester
†Fry, Thomas...Baglake Farm, Dorchester
†Fryer, W. Rolles...Lytchett Minster, Poole
Galpin, George...Tarrant Keynston, Blandford
Galpin, John...Dorchester
†Genge, Richard...Puddleton, Dorchester
†Goodden, John... Over Compton, Sherborne

Hambro, Charles...Milton Abbey, Blandford
Hiscock, Alfred...West Stone, Gillingham
Homer, G. Wood...Athelhampton Hall, Dorchester
Homer, John G....Martinstown, Dorchester
Hooper, Rev. W....Chilfrome Rectory, Dorchester
James, J. W....Mappowder, Blandford
†Kennard, Rev. R. B....Marnhull, Blandford
Kindersley, E. Leigh...Clyffe, Dorchester
Lambert, W. C....Stepleton Manor, Dorchester
Legg, T. Fry...Burton Bradstock, Bridport
Legge, Benjamin...Litton Cheney, Dorchester
Luff, J. W....Sturminster-Newton, Blandford
Mayo, Henry...Cokers Frome, Dorchester
†Medlycott, Sir W. C., Bt...Milborne Port, Sherborne
†Paget, Colonel...Park Homer, Wimborne Minster
†Parker, Hon. Cecil T....Evershot
Pitfield, A. J....Eype, Symondsbury, Bridport
Pitfield, John...Symondsbury, Bridport
Pope, Frank E....Great Toller, Dorchester
†Portman, E. W. B....Knighton House, Darweston, Blandford
†Portman, Hon. W. H. B., M.P....Bryanston, Blandford
Rodgett, Miles...Sandford, Wareham
Saunders, John O....Forston, Godmanstone, Dorchester
Saunders, T. Chapman...Watercombe, Dorchester
Shaftesbury, Earl of, K.G....St. Giles's, Cranbourne
Sheridan, R. Brinsley...Frampton Court, Dorchester
Smith, H. J....Stoke Abbott, Beaminster
Snow, Rev. G. D'Ozley...Langton Lodge, Blandford
Symes, Alfred O....Kingston, Long Bredy, Dorchester
†Thompson, William...Weymouth
Thresher, John...Corfe Hill, Weymouth
Turnbull, Thomas John...Wimborne St. Giles's (Salisbury).
Watts, V. B....Melcombe Horsey, Dorchester
†Williams, Robert...Bridehead, Dorchester

DURHAM.

Governors.

†Bowes, John...Streatham Castle, Staindrop
†Durham, Earl of...Lambton Castle, Durham

Members.

Apperley, Newton W...Rainton Gate, Fence Houses
Archer, Thomas, jun....Dunston, Gateshead
†Backhouse, Edmund, M.P...Polam Hill, Darlington
Bainbridge, Robert S...Cleatham Hall, Darlington
Bell, Thomas...Hedley Hall, Marley Hill, Gateshead
Blake, Thomas...Wolviston Grange, Stockton-on-Tees
Blenkinsop, John...Simon Side House, South Shields
†Blenkinsopp, G. J. L....Hoppyland Park, Bishop Auckland
Boyd, E. Fenwick...Moor House, Durham
Bradford, James...Bunker Hill, Fence Houses
†Briggs, Captain C. J....Hylton Castle, Sunderland
Brown, Ralph...Whickham, Gateshead
†Bryden, Robert...The Dene, Seaham, Durham
Clark, John...Oxclose House, Shadforth, Durham
Clark, Nathaniel...Beamish Park, Fence Houses
Cleasby, R. H....Broomside House, Durham
Crawford, John...Lumley Park, Fence Houses
Cusson, David...Cornforth, Ferry Hill
Darley, William...Edenvale, Castle Eden, Durham
Darling, Robert...Plawsworth, Chester-le-Street
Dent, Ralph John...Streatham House, Darlington
Dodds, John...Springwell House, Gateshead
Eade, Arthur...Aycliffe, Darlington
Easton, George...Horsley Hill, South Shields
†Easton, James...Nest House, Gateshead
†Eden, John...Beamish Park, Chester-le-Street
Errington, Roger...Victoria Mills, Sunderland
Ettrick, Anthony...North Hylton, Sunderland
Farmer, Andrew...Middridge Grange, Heighington
Fawcett, John...Durham
Ford, Thomas...Shincliffe, Durham
Forster, Charles F....Bishop Middleham, Ferry Hill
Forster, George E....Washington, Durham
Fowler, James...Park Hill House, Ferry Hill
Furneis, John J....Branden House, West Cornforth
Gillow, Rev. Charles...Ushaw College, Durham
†Greenwell, Thomas...Broomshields, Darlington
Gregory, John...Westoe, South Shields
Hall, Jonas...Low Field, Pierce Bridge, Darlington
Headlam, Morley...Whorlton, Darlington
Henderson, John...Horsely Hill, South Shields
Heslop, John T....Urpeth, Chester-le-Street
Hunter, John J....Whickham Grange, Gateshead
Hutchence, W. A....Raglan Place, West Hartlepool
Johnson, Lt.-Col. Edward...The Deanery, Chester-le-Street
Johnson, F. D....Aykleyheads, Durham
Keppell, Thomas...Leafield House, Butley, Chester-le-Street
Liddell, George, jun....Great Chilton, Ferry Hill
Lightfoot, William...Bishopton Court, Stockton-on-Tees
Macfarlan, Walter...Ledard, Darlington
Maclaren, Henry...Offerton Hall, Sunderland
Maclaren, William...Herrington Hill, Sunderland
Maddison, Henry...The Lindens, Darlington
Milbank, A. Sussex...Barningham, Barnard Castle
Monks, Major James...Aden Cottage, Durham
†Morgan, C. E....Flatts House, Bishop Auckland
Morgan, George...Cleves Cross, Ferry Hill
†Nimmo, E. J....Castle Eden, Durham
†Nimmo, William...Castle Eden, Durham
†Ogden, John M....Sunderland
Ord, John R....Haughton Hall, Darlington
†Parrington, H. M....Layton Sedgefield, Durham
†Pease, Edward...Greencroft West, Darlington
†Pease, J. W., M.P....Woodlands, Darlington
Potts, George...22, New Elvet, Durham
Pyman, W. H. S....The Willows, West Hartlepool
Quelch, J. Bewick...Bowburn House, Ferrybill
Ravensworth, Earl of...Ravensworth Castle, Gateshead
Rawes, John G....Shincliffe, Durham
Reay, Matthew...Heworth, Gateshead
Richardson, Robert...Ouston Farm, Chester-le-Street

Robinson, W. W....Southfield House, Sedgefield, Ferry Hill.
Rowlandson, Christopher...The College, Durham
Rowlandson, Samuel...The College, Durham
†Rowlandson, S....Newton Morrell, Darlington
Sadler, Samuel A....Preston Junction, Darlington
†Salvin, M. C....Burn Hall, Durham
Scarth, Leveson E....Staindrop, Darlington
Scarth, W. Thomas...Keverstone, Darlington
Scawin, Thomas...Durham
Stephenson, Robert...Brierton, Greatham, Durham
Steward, William...Lambton, Fence Houses
Stowell, W. Stow...Faverdale, Darlington
Stratton, George...Spinnymoor, Durham
Thompson, James...Hurworth, Darlington
Thompson, Rev. William...Eshe Land, Durham
Thompson, W. C....Barmpton, Darlington
Unthank, Robert P....Hallgarth Street, Durham
†Van Hansbergen, W. B....Woodlands Hall, Consett
Walker, R. C....Owton Fence House, West Hartlepool
Wall, G. Young, jun....New Exchequer Buildings, Durham
Wallace, Henry...Trench Hall, Gateshead
Wearmouth, Charles T....Old Wingate, Trimdon, Durham
White, Thomas...23, Old Elvet, Durham
†Whyte, James...Aldborough Hall, Darlington
Wilkinson, Rev. G. P....Harperley Park, Darlington
Wilkinson, P. S....Mount Oswald, Durham
Wilkinson, Robert...Little Chilton, Ferry Hill
Wilkinson, Rev. T. W....Crook, Darlington
Williamson, Rev. R. H....Whickham, Gateshead
Wilson, Charles...Shotley Park, Shotley Bridge
†Wilson, John G....Cliffe Hall, Darlington
†Wilson, R. Bassett...Cliffe House, Darlington
†Wilson-Todd, W. H....Halnaby Hall, Croft, Darlington
Wooller, W. A....Sadberge Hall, Darlington

ESSEX.

Governor.

Courtauld, Samuel...Gosfield Hall, Halstead

Members.

†Abrey, T. Shaw Hellier...Witham
Allerton, Alexander R....Colemans, Prittlewell
Andrews, A. S....Webb Lodge, Walthamstow
Ash, Frederick J....Chadwell St. Mary, Grays
Asplin, Francis...St. Cleres, East Tilbury, Romford
Baker, John...Hockley, Rayleigh
Baker-Wingfield, R....Orsett Hall, Romford
Balls, Thomas J....6, Priory Terrace, Colchester
Baring, T. C., M.P....High Beach, Loughton
Barker, P. C....Ingatestone
Barnard, J. Kidd...Harlow
Barnardiston, N. C....The Ryes (Sudbury)
Barnes, J. S....The Casina, Colchester
Bates, Charles...Dagenham, Romford
Bawtree, Octavius...West Lodge, Colchester
Beadel, William James...Chelmsford
Bear, W. E....Thorpe, Colchester
Belli, Rev. C. A....South Weald, Brentwood
Bentall, E. H....Heybridge, Maldon
Benton, Philip...Oldbury, Southend
Biddell, George...Orsett, Romford
Blewett, Edward R....Rainham, Romford
†Boghurst, William P....Frating Abbey, Colchester
Bott, Joseph Fennell...Morrell Roothing, Dunmow
Brampton, John...Ramsey, Harwich
†Braybrooke, Lord...Audley End, Saffron Walden
Bridge, Thomas...Buttsbury, Ingatestone
Brise, A. W. Ruggles...Durwards, Witham
†Brise, Lieut. Col. S. B. R., M.P..Spains Hall, Braintree
†Burnell, Edward...Chappel, Halstead
†Butler, Edward...Ewell Hall, Kelvedon
Butler, Frank...Childerditch Hall, Brentwood
Cant, G. H....Mile End, Colchester
†Carey, Arthur...Rochford
Catchpool, Edward...Feering Bury, Kelvedon
Chaplin, J. R..Three Chimneys, Ridgewell, Halstead
Cheffins, Henry...Little Easton Manor, Dunmow
†Chetwode, A. L....Berners Hall, Ongar
Christy, David...Patching Hall, Chelmsford
Christy, James, jun....Boynton Hall, Chelmsford
Clayden, J. Carter...Radwinter, Saffron Walden
†Clayden, Henry...Great Ilford
Cole, Philip...East Horndon, Braintree
Coleman, H. S....Chelmsford
†Colvin, R. B....Monkham Hall, Waltham Abbey
Conder, Edward...Elm Hurst, Romford
Corder, Edward...Writtle, Chelmsford
Cottingham, R. M. J....Great Chesterford, Saffron Walden
Cowell, John Ray...Ashdon (Linton)
Cross, Henry...Barling, Rochford
Cross, William...West Terrace, Colchester
Crush, A. W....Mountnessing Hall, Brentwood
Cutts, John...Little Bardfield Hall, Braintree
Davey, H. M....Beverley Villas, Colchester
Delf, William...Walton-on-Naze
Disney, Edgar...The Hyde, Ingatestone
Du Cane, Sir Charles, K.C.M.S....Braxted Park, Witham
Eaton, Horatio W....Romford
Eddington, William...Chelmsford
Ewen, Major...The Rookery, Dedham
Fitch, Edward A....Brick House, Maldon
Float, John Charles...Maldon
†Frankham, John...Little Canfield Hall, Chelmsford
†Fytche, Major-General A....Pyrgo Park, Havering, Romford.
Gepp, Thomas Morgan...Chelmsford
Gibson, E. B....Saffron Walden
Gilders, George...Great Horkesley, Colchester
Gingell, George ..High Laver Hall, Ongar
†Glenny, Thomas Walton...Linton Road, Barking
†Glenny, W. W....Cecil House, Barking
Green, Daniel A....East Donyland, Colchester
Green, James John...Great Parndon, Harlow
†Gurdon-Rebow, Hector J..Wyvenhoe Pk., Colchester

Hall, Collinson...Navestock, Romford
Hall, Collinson...Dytchley, Brentwood
Hallam, Thomas G....Wormingford, Colchester
Hanbury, Osgood, jun....Howe Hatch, Brentwood
Hardy, James...Jaques Hall, Manningtree
Hart, George...Canes, Harlow
Heathcote, R. Boothby...Friday Hill, Chingford
Hempson, A....Ramsey, Harwich
Henniker, Sir Brydges, Bart....Newton Hall, Dunmow
Hilliard, G. B....Chelmsford
Hobbs, William...Derwards Hall, Braintree
Holmes, Benjamin...Hornchurch
Honywood, Mrs.... Mark's Hall, Kelvedon
Hosley, W. Seymour...Audley End, Saffron Walden
Howard, Colonel S. Lloyd...Goldings, Loughton
Hunt, Reuben...Earls Colne
Impey, William...Broomfield Hall, Chelmsford
Ind, Edward...Great Warley, Brentwood
Jillings, John...Great Chesterford, Saffron Walden
Johnson, Samuel...Lamford, Manningtree
†Jonas, F. M....Chrishall Grange, Saffron Walden
†Kemble, Thomas...Runwell Hall, Chelmsford
†King, George...Saffron Walden
Lambert, Thomas M....Castle Farm, Ongar
†Lay, John Watson...Walcotts, Great Tey
Lee, William John...Pigtail, Romford
†Lennard, Sir T. B., Bart....Belhus House, Avely
†Lowndes, G. A....Barrington Hall, Harlow
†Majendie, Lewis A., M.P.... Castle Hedingham, Halstead
†McIntosh, D....Havering Park, Romford
Marriage, John...Moulsham Lodge, Chelmsford
Mashiter, Thomas...Priests, Romford
Masters, A. E..Nevendon Hall,Wickford, Chelmsford
Mathews, Thomas...Plashet House, East Ham
†Matson, Murton...Saint Osyth, Colchester
Mechi, John J....Tiptree Hall, Kelvedon
†Mee, Edward D....Broomhills, Billericay
Meeson, W. T....Doggetts, Rochford
†Meyer, Herman P. D....Little Laver Hall, Ongar
Mildred, Henry...Warley House, Great Warley
Moss, Benjamin...Ashingdon Hall, Rochford
Mulvany, John...Essex Arms Hotel, Brentwood
Newcome, Samuel...White Crofts, Orsett
Onley, O. Savill...Stisted
Page, W....Southminster, Maldon
†Palmer, G. W.... Greenwood, Bishops Waltham
†Palmer, R. C....Nazing
†Papillon, P. O....Manor House Lexden, Colchester
Parker, J. Oxley...Woodham Mortimer, Maldon
Parsons, C....North Shoebury Hall, Rochford
Partridge, W. P....Elmstead Hall, Colchester
Patch, Thomas...Faircross, Barking
Paxman, James...Bank Buildings, Colchester
Payne, Henry...Birdbrook, Halstead
Pemberton, Robert...Hare Hall, Romford
†Perry-Watlington, J. W....Moor Hall, Harlow
Pertwee, James...Boreham, Chelmsford
Pidgeon, Jonathan S....Warley Arms, Brentwood
Piggot, J. Algernon...Beckingham Hall, Witham
Portway, Charles...Halstead
Pound, Philip G....Hornchurch
Pryor, Arthur...Hylands Park, Chelmsford
Puckridge, A. F....Forest House, Chigwell
†Raincock, H. D....Waltons, Ashdon (Linton)
Ray, Charles...Foxearth (Long Melford)
†Ray, Samuel...Great Yeldham, Halstead
Ridley, T. D....Chelmsford
†Ross, James...Hatfield Broad Oak
†Rosslyn, Earl...Easton Lodge, Dunmow
Rosslyn, Edward...Melbourne, Chelmsford
†Roynon, John ..Havering Park Farm, Romford
Rust, W. H....Falconers Hall, Chelmsford
Sandle, William...Great Bardfield, Braintree
†Scragg, William...Great Clacton, Colchester
Sewell, Daniel...Beaumont Hall, Colchester
†Smith, Sir C. Cunliffe W., Bart....Suttons, Romford
Smith, Frederic...336, High Street, Stratford, E.
Smyth, James...Peasenhall, Yoxford
Spencer, Edward Stacey...Stanstead
Spencer, T. A....Clavering Hall, Halstead
†Stable, R. Scott...Cleveland Road, Wanstead, N.
Stane, J. Bramston...Forest Hall, Ongar
†Strutt, Hon. C. H....Whitelands, Terling, Witham
†Strutt, Hon. E. G....Terling, Witham
Sturgeon, C....South Ockendon Hall, Romford
Sworder, W....Tawney Hall, Romford
Symondson, G....Upshire Hall, Waltham Abbey
Tayler, Rowland...Colchester
†Tayleur, W. H....Snows, Nazing
Taylor, Henry...Romford
Taylor, Vero W.., Castle Hedingham
†Thompson, W., jun....Thorpe-le-Soken, Colchester
Tomlinson, J. H....Shelley Hall, Ongar
Tompkins, John...Aveley Hall, Romford
†Tower, C. J. H....Weald House, Brentwood
†Townsend, Rev. C. G. G...Berwick Place, Hatfield Peverell, Chelmsford
Trigg, Henry...Bury Lodge, Stansted Mountfitchett
Tufnell, J. Joliffe...Langleys, Chelmsford
†Turnbull, John G....Mellenden Lodge, Wanstead
Upson, James...Rivenhall, Witham
†Vaizey, John R....Attwoods, Halstead
†Wagstaff, T....Stifford, Romford
†Warren, Rev. J. C. B....Horkesley Hall, Colchester
Watson, J. Y....The Grange, Thorpe-le-Soken, Colchester
†Webb, Henry, jun....Abberton, Colchester
Webster, Charles...Waltham Abbey
Wedlake, Thomas William...Hornchurch, Romford
Welch, Henry James...Bendysh Hall, Radwinter, Saffron Walden
Whitlock, F...Lovingtons, Great Yeldham, Halstead
Whitlock, John...Great Yeldham Hall, Halstead
Wilkin, A.C....Tiptree Heath, Kelvedon
Williams, Oliver John...Dovercourt
Windus, Edward Ernest...Great Easton, Dunmow
Wiseman, James F. T....Paglesham, Romford
Wood, John...Langford Hall, Maldon
Woodward, Henry...Stanway Hall, Colchester
Wragg, John...Takeley, Chelmsford
Youngman, Benjamin...Elms Farm, Walthamstow

GLOUCESTERSHIRE.

Governors.

†Barker, John Raymond...Fairford Park, Fairford
Hale, Robert Blagden...Alderley Park, Wotton
Hartley, W. H. H...Lye Grove, Cross Hands, Sodbury
†Holford, R. S., M.P....Weston Birt House, Tetbury
†Kingscote, Col., M.P....Kingscote, Wotton-under-Edge
†Moreton, Lord...Tortworth Court, Falfield
†Northwick, Lord...Moreton-in-the-Marsh

Members.

†Ackers, B. St. John...Prinknash Park, Painswick
Acock, Arthur...Cold Aston, Northleach
Agg, Colonel...Hewletts, Cheltenham
Anderson, Robert A....Cirencester
Arkell, Daniel...2, Butlers Court, Lechlade
Arkell, Henry...Boddington House, Cheltenham
†Arkell, William...Hatherop, Fairford.
Avery, Thomas Charles..27, Promenade, Cheltenham
†Bailey, Henry...Cirencester
Baker, H. Orde Lloyd...Hardwicke Court, Gloucester
†Baker, T. Barwick L...Hardwicke Court, Gloucester
Barber, George...Beverstone, Tetbury
Barber, Richard C....Charlton Court, Tetbury
†Barton, Charles...Fifield, Lechlade
Barton, James T....Elmstree, Tetbury
Bazley, Thomas S....Hatherop Castle, Fairford
†Beach, Right Hon. Sir M. E. Hicks, Bart., M.P.... Williamstrip Park, Fairford
†Beak, George...Stanford Hall, Lechlade
Beaven, C...Ivy House Farm...Shipton Moyne, Tetbury
Bengough, J. C....The Ridge, Wotton-under-Edge
Bennett, Joseph...Cam, Dursley
†Bennett, Joseph R....Chax Hill House, Gloucester
†Blackwell, G., jun....Kingscote, Wotton-under-Edge
Bowly, Edward...Siddington House, Cirencester
Bowly, William...Cirencester
Brain, William...Greet, Winchcombe
Bravender, John...Cirencester
†Brooke-Hunt, Arthur E....Peers Court, Dursley
Bullock, Frederick...Hewelsfield, Coleford
Butcher, S. W....Standish Park, Stonehouse
Butler, John...Tetbury
Browne, T. Beale...Salperton Park, Andoversford
†Cadle, Clement...Clarence Street, Gloucester
Cadle, J....Kingsholme House, Gloucester
†Cadle, Thomas...Longcroft, Westbury-on-Severn
Campbell, R....Buscot Park, Lechlade
Capel, William...The Grove, Stroud
Castree, Josiah...College Green, Gloucester
Castree, Josiah, jun....College Green, Gloucester
Cathcart, P. H....Agricultural College, Cirencester
†Chance, T. H.. .Lennox House, Gloucester
Chandler, C....The Vails, Stonehouse
†Chapman, Charles...Frocester Court, Stonehouse
†Cole, Henry...Ashbrook, Cirencester
Constable, Rev. John...The College, Cirencester
Cook, Thomas...Taddington, Broadway
Cooke, James Herbert...Berkeley Castle
Cornock, John...Burleigh Court, Dursley
Cox, Henry...Minchinhampton
Creese, William...Teddington, Tewkesbury
Croome, J. Capel...Bagendon House, Cirencester
†Cullimore, William...Shepperdine, Thornbury
†Cummins, John, jun....Nelfields, Newent
†Davies, Robert P....Horton, Chipping Sodbury
†Dent, John Coucher...Sudeley Castle, Winchcombe
De Winton, Capt. T....Wallsworth Hall, Gloucester
Dobbs, Samuel Friday...Huntley, Gloucester
†Dorington, John E....Lypiatt Park, Stroud
Drew, B....Boxwell, Wotton-under-Edge
Drew, Edwd...Leighterton, Wotton-under-Edge
†Ducie, Earl of...Tortworth, Wotton-under-Edge
Edmonds, Giles...Eastleach, Lechlade
Edmonds, William John...Southrope, Lechlade
†Eggington, John Lloyd...Cirencester
Ellett, Robert...Oakley Villa, Cirencester
Elwes, John H....Closeburn House, Cheltenham
Estcourt, George B., M.P...Newnton House, Tetbury
†Eyre, Edwin...Kingshill, Dursley
Farmer, Edmund...Moreton-in-the-Marsh
†Fitzhardinge, Lord...Berkeley Castle
Fletcher, George...Shipton, Cheltenham
†Fletcher, W. H....Shipton Oliffe, Cheltenham
†Ford, Charles...Horsley, Nailsworth
†Foster, T. Nelson...Allt Dinas, Bayshill, Cheltenham
Fowler, E. Pope...Aston Farm, Avening, Stroud
Fowler, William...Hartpury, Gloucester
Gardner, John W....Long Street, Tetbury
Garlick, James...Beverston Castle, Tetbury
†Garne, John...Filkins, Lechlade
†Garne, Robert...Aldsworth, Northleach
†Garne, William...Cerney, Cirencester
†Garne, W. Gillett...Broadmoor, Bourton-on-the-Water
†Garne, W. T....Aldsworth, Northleach
†Golledge, Matthias...Forthampton, Tewkesbury
Goulter, Allen...Hawkesbury, Chipping Sodbury
Haine, George...Over Farm, Gloucester
Haines, John Poole...Boteler House, Cheltenham
Handy, Edward...13, Pittville Villas, Cheltenham
†Harding, John...Dursley.
†Harding, Joseph...Slimbridge, Stonehouse
Hare, Sholto Vere...Knole Park, Almondsbury
Harris, G....Courthouse Farm, Cam, Dursley
Harrowby, Earl of, K.G....Norton House, Campden
†Hatherell, W....Newington Bagpath, Wotton-under-Edge
Henry, Francis...Elmestree, Tetbury
Hill, John...Line House, Newent
Hobbs, Charles...Maisey Hampton, Fairford
Hoddinott, F....Waterhatch Farm, Winchcombe
Holborow, Daniel B....Knockdown, Tetbury
†Holborow, D.C...Hazleton Farm, Cirencester
Holborow, H....Willesley, Tetbury
Holmes, Colonel...Charlton Kings, Cheltenham
†Hooper, Robert N....Stanshawes Court, Tate
Horne, Thomas...Moreton-in-the-Marsh
Horniblow, W. T....Ripple, Tewkesbury
†Howell, Henry...Coates, Cirencester
Hudson, Charlie...Kinsham, Tewkesbury
†Hulbert, T. R....North Cerney, Cirencester

Hyett, F. A....Painswick House, Stroud
Iles, Daniel...Fairford Retreat, Fairford
Iles, Richard A....Reevy Farm, Kempsford, Fairford
†Ireland, William...Forthampton, Tewkesbury
James, Isaac...Tivoli, Cheltenham
†Jenkinson, Sir G. Bart., M.P....Eastwood, Berkeley
Jones, George...Upton St. Leonards, Gloucester
Jones, John...Ashleworth, Gloucester
Jordan, William...Charlton Kings, Cheltenham
Key, Lieut.-General...Coates, Cirencester
Kilminster, E. M....Calkerton, Tetbury
†Kingscote, Nigel R. F....Kingscote, Wotton-under-Edge
†Knight, Edward...High Leadon, Newent
Knowles, William...Gloucester
†Lancaster, Thomas...Bownham House, Stroud
†Lane, William...Broadfield, Northleach
†Lawrence, W....Pirton Court, Gloucester
Leatham, A. W....Miserdine Park, Cirencester
Leigh, William...Woodchester Park, Stonehouse
Lewis, Thomas...Preston, Cirencester
Limbrick, William...Down Farm, Tetbury
Little, Lewis D...Driffield, Cirencester
Long, Daniel...Whaddon, Gloucester
Mabbett, John...Stinchcombe, Dursley
Makgill, George,..Prestbury, Cheltenham
Marsh, W. J....Loridge, Berkeley
Master, Col. T. C....The Abbey, Cirencester
Mathews, A....Pitchcombe, Stroud
Meats, Albert...Pyon Villa, Gloucester
Morris, Thomas...Maisemore, Gloucester
Mullins, Isaac...Alvington, Lydney
Nicks, William...Greville House, Gloucester
Norris, Thomas...Church Farm, Cam, Dursley
Parson, Edgecombe...Coates, Cirencester
Peacey, William...Chedglow, Tetbury
Pedley, Joseph H....Bibury, Fairford
Peter, James...Ham Villa, Berkeley
†Peter, John...Kingscote, Wotton-under-Edge
†Playne, E. H....Frampton Mansell, Chalfont
Porter, Thomas...Baunton, Cirencester
Price, W. P....Tiberton Court, Gloucester
Priday, William...Highnam, Gloucester
†Probyn, Edmund...Huntley
Pullen, S. C....The Laurels, Itchington, Alveston
Randall, John...Stroud
Rich, Edmund...Willesley, Tetbury
†Rich, Robert...Willesley, Tetbury
†Ricketts, James...Westbury-on-Severn
Roberts, G..Wormington Grange Farm, Winchcombe
Rolt, Mrs...Orgleworth, Wotton-under-Edge
†Russell, Sir W., Bt....Charlton Pk., Cheltenham
†Sartoris, Alfred...Abbotswood, Stow-on-the-Wold
Savage, S. P....Leys Farm, Wotton-under-Edge
Savory, Paul Haines...Gloucester
Sharp, W. F....Dedbrook, Winchcombe
†Shaw, Rev. G. E. F..Edgeworth Rectory, Cirencester
Simons, Rev. C. Walker...Saintbury (Broadway)
†Skillicorn, W. Nash...Cheltenham
Slatter, Charles...Frampton Farm, Winchcombe
Smith, William...Berkeley
†Smith, William...Winchcombe
Snowsell, James...Ampney Knowle, Cirencester
Stewart, Arthur...Saint Bridge Farm, Gloucester
†Stinton, William...Forthampton, Tewkesbury
†Stoughton, Thomas A....Owlpen, Uley
Surman, J. S....Swindon Hall, Cheltenham
†Swanwick, R....College Farm, Cirencester
Swinburne, T. W....Corndean Hall, Winchcombe
†Talbot, George C....Temple Guiting, Winchcombe
†Thackwell, John...Wilton Place, Dymock
†Thomas, C. H....Charlton, Filton
Thompson, John A....Stanton, Winchcombe
Tombs, John...Langford, Lechlade
Tovey, Joseph...Cirencester
Trimmer, Edward...Gloucester
Trinder, Edward...Cirencester
Villar, Henry...Charlton Kings, Cheltenham
Villar, James...Charlton Kings, Cheltenham
Viveash, Oriel...Strensham, Tewkesbury
Waddingham, John...Guiting Grange, Winchcombe
Walker, James...Northleach
Walker, Thomas...Stowell Park, Northleach
Waller, Hugh S....Farmington, Northleach
Warner, W. C....Oakley, Cirencester
Watts, John...Example Farm, Whitfield, Falfield
Wemyss-Colchester, M. W. ... The Wilderness, Micheldean
Wheeler, A. C....Upton Hill, Gloucester
†Whitcombe, George...Tuffley, Gloucester
Wilkins, Henry...Westbury-on-Severn
†Williams, Henry E....East End House, Fairford
†Withington, James...Battledown, Cheltenham
Witts, F. R. V..Upper Slaughter, Stow-on-the-Wold
Woodward, John...Uckington, Cheltenham
Workman, Joseph....Wotton-under-Edge
Yorke, Joseph...Forthampton Court, Tewkesbury

HAMPSHIRE.

Governors.

Ashburton, Lord...The Grange, Alresford
†Eversley, Viscount...Heckfield Place, Winchfield
†Ewall, Ralph...Andover
†Hulse, Col. Sir E., Bt..Breamore House, Fordingbridge
†Macdonald, Sir A. K., Bt...Woolmer Lodge, Liphook
Normanton, Earl of...Somerley, Ringwood

Members.

Addison, Joseph...Mapledurwell, Basingstoke
Allen, Stephen H....Eastover, Andover
Arnold, Matthew...Westmeon, Petersfield
Attrill, Daniel, jun....Dean Farm, Whitwell, I. W.
Beach, W. W. B., M.P....Oakley Hall, Basingstoke
Beadon, Rev. F....North Stoneham Rectory
Best, Rev. Thomas...Red Rice House, Andover
Bethell, Hon. Slingsby...Tangier Park, Basingstoke
Blundell, F. J....24, Portland Street, Southampton
Boxall, W. B ...Strathfieldsaye, Winchfield
†Brook, Samuel Edwin...Park Farm, Ryde, I. W.
Bull, William...Empshott, Petersfield
Burnett, David...Ashley, Stockbridge
Burrell, J. F....Frimley, Farnborough Station
Caird, James A. H....Warren Farm, Micheldever

†Calthorpe, Lord...Elvetham, Winchfield
Cardus, John...Town Hill, West End, Southampton
Carnegie, Hon. J. J....Fair Oak, Petersfield
†Carpenter, Henry S....The Firs, Alton
†Carter, John Bonham, M.P....Adhurst St. Mary's
Chalcraft, H....Amory Farm, Alton
†Chalcraft, James...Stroud, Petersfield
Chinery, John...Wootton, Milton, Lymington
†Churchill, George...Alderholt, Fordingbridge
Chute, W. L. Wigget...The Vyne, Basingstoke
†Cleeve, H. Lacy...Hatchwarren, Basingstoke
Coleberd, Robert...Purewell Farm, Christchurch
†Collins, Henry...Aldsworth House, Emsworth
Cross-Buchanan, W....Sunnyside, Portswood, Southampton
Cumberbatch, L....Queens House, Lyndhurst
Currie, Raikes...Minley Manor, Farnborough
Curtis, Charles E.... Deanyers, Farringdon, Alton
Dear, Mrs....Millbrook, Southampton
†Dilke, Sir C. W., Bart, M.P....Bedhampton, Havant
Dixon, Cecil B....Shirley Warren, Southampton
†Doridant, Charles...Aldershot Park
Dorrington, Charles H....Otterburne, Winchester
Downs, Henry...Manor House, Basingstoke
Drewitt, Henry...Manor Farm, Titchfield
†Duncan, George...Coldrey, Alton
Duplessis, Jules...Newtown Park, Lymington
Elliott, Thomas J....Southwick, Fareham
Elphinstone, A....Chewton Glen, Christchurch
Erle, Rt. Hon. Sir W....Bramshot Grange, Liphook
Esdaile, W. C. D....Burley Park, Ringwood
†Eyre, G. E....Warrens, Stoney Cross, Southampton
†Eyre, Robert T....Hartley, Totton, Southampton
†Farr, William Wyndham...Iford, Christchurch
Fitt, W. E....Hermitage, Weeke, Winchester
Fitzwygram, Major-Gen. Sir F., Bt....Leigh Park, Havant
†Fowle, W. H....Chute Lodge, Andover
Galpin, Thomas P....Grateley, Andover
Gater, John...West End, Southampton
†Gotch, W. H....Chilcombe Farm, Winchester
†Hambrough, A. J...Steephill Castle, Ventnor, I. W.
Hammick, H. H....The Mirables, Undercliffe, I. W.
†Harris, Charles E....Tylney Hall, Winchfield
†Heathcote, Capt. E...Blashard, Lyndhurst
Herbert, Hon. A....Ashley Armwood, Lymington
Hewett, James...Posbrooke, Titchfield
Hodges, J. O....Snakemoor Farm, Derby
Hollings, John...The Watchetts, Farnborough
†Huddleston, T. F. C....Upton Grey, Winchfield
Hudson, J. Blakeny...East Dereham
Hutt, Right Hon. Sir W., K.C.B....Appley Towers, Ryde
†Jervoise, A. T. E....Weston Corbett, Odiham
†Jervoise, F. Ellis, J....Herriard Park, Basingstoke
†Kennard, A. S....Crawley Court, Winchester
Kent, George E....Stubbington Lodge, Portsea
King, W. David...Farlington Farm, Havant
†Knighton, Sir William W., Bart....Blendworth Lodge, Horndean
Leggatt, H. B....Brownwich, Fareham
Leggatt, S. B....Crofton, Titchfield
Linzee, Robert G....Wroxmore Park, Romsey
†Longbourne, John...Ripsley, Liphook
†Longcroft, C. J....Havant
Lyne, R. Seager...Compton, Winchester
Lyon, Miss M....The Oaks, Emsworth
Lywood, John...Upper Clatford, Andover
McCalmont, A. L....Highfield, Southampton
†Malcolm, Mrs....Beechwood, Lyndhurst
Malmesbury, Earl of...Heron Court, Christchurch
Marsh, Matthew H....Ramridge, Andover
†Maxse, Admiral...Holly Hill, Southampton
†Mildmay, Sir H. St. John, Bart...Winchfield
Mills, John...Bisterne, Ringwood
Morris, H. S....Mayfield, Weston, Southampton
†Murray, Major...Ossemsley Manor, Christchurch
Neale, M. T....Auckland Road East, Southsea
Newton, F. H....Springbourne, Bournemouth
Nichol, Rev. F. G. S....Litchfield Rectory, Micheldever
†Nightingale, W. E....Embley, Romsey
†Ohrly, H. G., jun....St. Leonards Villa, Sandown
Padwick, Frederick...West Thorney, Emsworth
Pain, Thomas...The Grove, Basingstoke
†Palmer, G. W. Greenwood...Bishops Waltham
Parsons, William...West Stratton, Micheldever
†Peacocke, Warren...Efford, Lymington
†Peterson, A. T. T....Drumdnar, Lymington
†Pinnegar, Christopher...Rockbourne, Fordingbridge
Pratt, Frederick...Westmeon, Petersfield
Purrott, C....Cliftonville, Westend, Southampton
†Raynbird, Hugh...Church Street, Basingstoke
†Ricards, Mortimer...Bure Homage, Christchurch
Robson, William...Summerfield, Bournemouth
Scott, Arthur J....Rotherfield Park, Alton
†Shrubb, J. Lane...Rodlease, Lymington
Simonds, W. B., M.P....Abbot's Barton, Winchester
Simpson, Valentine...Albany, Fareham
Smith, Henry James...Hall House Farm, Ledbury
†Smith, William...West End, Southampton
†Spooner, W. C....Eling, Southampton
Stratton, F....Merdon, Hursley, Winchester
†Stratton, James...Chilcombe, Winchester
Stubbs, John...Langrish Farm, Petersfield
Tasker, William...Andover
†Taylor, H. Minton...Eastleigh, Southampton
Thistlethwayte, T....Southwick Park, Fareham
Thursby, Colonel...Holmhurst, Christchurch
Timson, H ...Tatchbury, Totton, Southampton
Toward, Andrew...Castle Road, Newport, I. W.
Turvill, John...Hartley Park Farm, Alton
†Waddington, John...Langrish House, Petersfield
†Walker, James...Buriton Manor Farm, Petersfield
Wallis, Arthur...Basingstoke
†Warner, Henry, jun....Farringdon, Alton
Way, Henry...Dodpits House, Yarmouth, I. W.
†Way, Lewis A....The Haven, Bournemouth
Wellington, Duke of...Strathfieldsaye, Winchfield
Wheeler, R....Steephill Farm, Ventnor, I. W.
†Whitear, R. B....Martyr Worthy, Winchester
†Winchester, Marquis of...Amport House, Andover
Wolfe, Edward A....Mouseton, Andover
Woodman, Richard...Somborne Park, Stockbridge
†Woods, Henry...Warnford, Bishops Waltham
Woodthorpe, Edmund...Grayshott, Liphook
Wooldridge, Henry...Meon Stoke, Bishops Waltham
Young, Captain F....The Terrace, Ryde, I. W.

†Greene, Harry Arthur...Crown Street, St. Ives
†Hall, James...Little Barford, St. Neots
†Heathcote, John M....Connington Castle, Stilton
How, James...Broughton, Huntingdon
†Johnstone, Rev. George...Broughton
Jones, Alfred...Ramsey
†Margetts, Charles...Huntingdon
Middleton, Saville...Water Newton (Wansford)
Milligan, Thomas...Dean, Kimbolton
†Morrison, John...Bushmead Priory, St. Neots
†Newton, G. Onslow...Croxted Park, St. Neots
†Newton, S. C....The Downs, Croxton, St. Neots
†Peppercorn, J. H....Eaton Socon, St. Neots
Purves, Peter...Brampton, Huntingdon
Pyke, Barford...Willingham, St. Ives
Rowell, John....Manor Farm, Bury
Rust, George John..Halconbury House, Huntingdon
Sandwich, Earl of...Hinchingbrooke House
Shepperson, J. W....Forty-foot Bridge, Ramsey
†Sherard, Lord P. Castel...Glatton, Stilton
Smith, Thomas...Brooklands, Alconbury
Spencer, S....Holywell, St. Ives
Street, Frederick...Somersham Park, St. Ives
†Tillard, Philip...Stukely Hall, Huntingdon
Turner, Jabez...Norman Cross, Yaxley
Welstead, F....The Cottage, Stonely, Kimbolton
Willson, J. Larkham..Wornditch House, Kimbolton
Windover, Charles S....Huntingdon

KENT.

Governors.

†Brassey, Henry A., M.P...Preston Hall, Aylesford
Darnley, Earl of...Cobham Hall, Gravesend
†Harris, Lord...Belmont, Faversham
Loyd, Lewis...Monks Orchard, Bromley
†Torrington, Viscount...Yates Court, Mereworth

Members.

†Abergavenny, Marquis of...Eridge Castle, Tunbridge Wells
†Adams, G. T....Hawkhurst
Alexander, J. C....Herne Hill, Faversham
†Alexander, R., C.B....Downs House, Yalding
Amos, James...Broomfield, Herne Bay
†Anderson, William...Lesney House, Erith
Andrews, Henry...Great Chart, Ashford
†Appach, Reginald...Swattenden, Cranbrook
†Ashbee, John K....Colkins, Faversham
Aveling, Thomas...Rochester
†Aveling, Thomas Lake...Rochester
Awcock, Henry...Oxen Heath, Tonbridge
Baggallay, Sir R....Mapletreuse, Edenbridge
Baker, Fredk....Manor Farm, Frindsbury, Rochester
Baker, W. de Chair...St. Stephens, Canterbury
†Balston, Richard J....Boxley Abbey, Maidstone
Balston, Thomas...Chart Hill, Staplehurst
†Barrow, J. J....Holmewood, Tunbridge Wells
†Bayden, Thomas...Hythe
†Beale, William...Larkins Farm, Chiddingstone
†Bean, Alfred W....Dansome Park, Welling
†Beard, Frederic...Horton, Canterbury
Beer, James Henry...29, St. George's St., Canterbury
†Bell, C. W....Thor, Birchington
Bell, Matthew...Bourne Park, Canterbury
Best, Major M. G....Boxley, Maidstone
†Bevan, T....Stone Park, Dartford
Blenkiron, William...Middle Park, Eltham
†Board, John...Westerham, Sevenoaks
Body, John...The College, Wittersham, Ashford
†Booth, S. B....Effingham Lodge, Bickley
Bowstead, J. C....Binbury Manor, Maidstone
Buckland, John A....Biddenden, Staplehurst
†Burra, William Pomfret...Ashford
Bury, Capt....Wateringbury, Maidstone
Busbridge, T. H....Pimps Court, East Farleigh, Maidstone
Bushell, William...Poulton, Wingham
Buss, B....Horsmonden, Staplehurst
Butcher, Thomas...Selling, Faversham
Butcher, William...Gosmere, Selling, Faversham
Butler, James M....Cranbrook
†Campbell-Bannerman H., M.P....Gennings Park, Maidstone
Carter, William...Ospringe House, Faversham
Castle, William...Yoke Farm, Strood, Rochester
†Cazalet, E. Fairlawn...Tonbridge
†Chambers, Charles...Langley, Maidstone
†Champion, F. C....2, Kidbrooke Villas, Blackheath, S.E.
†Cheesman, Frederick...Little Chart, Ashford
Chittenden, Andrew...Detling, Maidstone
Chittenden, James...Hope All Saints, New Romney
Chittenden, John...Newchurch, New Romney
†Clarke, R. B....Eldridge, Southwell, Chislehurst
†Cobb, Herbert M....Higham, Rochester
Cobb, John...Sheldwick, Faversham
Cobb, Robert L....Higham, Rochester
Coles, Edward Robert...Rochester
Collard, Charles...Little Barton, Canterbury
Colledge, John W....Upper Grosvenor Road, Tunbridge Wells
†Collyer, A. T....Cedar Cottage, Forest Hill
†Colyer, William...North End, Crayford
†Court, P. Simpson...140, Snargate Street, Dover
Crispe, Henry...Ploggs Hall, Tudely, Tonbridge
†Croft, Sir John, Bart....Kingsdown, Sittingbourne
Crowhurst, Charles. .Maidstone
Curling, Arthur D....Herne Hill, Faversham
Curling, Edwin Henry...Brookland, Whitstable
D'Aeth, N. H....Knowlton Court, Wingham
†Dashwood, Maitland...Bexley
†Dawson, William Edward...Plumstead Common
Day, John...Chilham, Canterbury
†Deacon, John...Mabledon, Tunbridge
De Laune, C. De Laune F....Sharsted Court, Sittingbourne
†De L'Isle and Dudley, Lord...Penshurst Park
Devas, Charles F....Pickhurst, Beckenham
Dixon, Henry...Frankham, Tunbridge Wells
†Dungey, James...Middletons, Cranbrook
Dungey, Walter...Pattenden Farm, Goudhurst
†Duppa, George...Hollingbourne House, Maidstone

Dyke, Sir Wm. Hart, Bart., M.P..Lullingstone Castle, Dartford
†Edwards, Arthur...Fern Bank, Tunbridge Wells
Edwards, James L....Rochester
†Elgar, Frederick...St. Margaret's, Rochester
†Ellis, Robert Ridge...Yalding
Evans, R. Percival...Watling Court, Canterbury
Falmouth, Viscount...Mereworth Castle, Maidstone
†Filmer, Sir E., Bart...East Sutton Park, Staplehurst
Finn, G. W....Preston, Faversham
†Finnis, Sterriker...The Elms, Hougham, Dover
Fletcher, Charles E....Kenward, Yalding
†Fletcher, Lionel J. W....Kenward, Yalding
†Ford, Sir F. C., Bart.... Hartfield, Tunbridge Wells
Freeman, James...Otford, Sevenoaks
†Fry, James Thomas...Boston, Bromley
Gardner, William...Bekesbourne, Canterbury
Geary, Sir Francis, Bart....Oxon Heath, Tonbridge
Gibbens, Edward...Minster, Isle of Thanet
Godwin, J. S. S....Hadlow, Tonbridge
†Goldsmid, Julian, M.P....Summerhill, Tonbridge
†Goodhart, Charles E....Langley, Beckenham
Goodhew, David...Minster, Sheppy, Sheerness
Goodwin, E. J....Canon Court, Wateringbury, Maidstone
†Gordon, Admiral...Ingledon, St. Michael's, Ashford
Gow-Steuart, Herbert J. S....Fowler's Park, Hawkhurst
Hague, Jenkin...Biddenden, Staplehurst
Hague, John...Cranbrook
†Hamilton, W. M....2, Orchard Place, Canterbury
Hammond, William...Hunton, Maidstone
Hankey, G. A.....Town Court Farm, Tunbridge Wells
Hardinge, Sir E. S., Bart....Bounds Park, Tunbridge Wells
Hardy, Charles S....Chilham Castle, Canterbury
Hartridge, W. F....East Farleigh, Maidstone
Harvey, J. J....Statenborough House, Sandwich
†Harvey, John J. S....Statenborough House, Sandwich
Harvey, W. F....Thruxted, Chartham, Canterbury
†Hatfeild, C. T....Hartsdown House, Margate
Henderson, John...Upton House, Sandwich
†Hilder, W....Wrotham, Sevenoaks
Hilton, Robert S....Harbledown, Canterbury
Hilton, S. M....Brambling, Wingham
Hilton, Captain T....Selling, Faversham
Hoar, Edward, jun....Otham Rectory, Maidstone
Hoare, Charles A. R....Eden, Beckenham
Hodsoll, J. Hackett...Loose Court, Maidstone
†Hohler, Henry B....Fowkham Manor, Dartford
Holmden, James...Marlpit Hill, Edenbridge
Hooper, George W....Cottington Court, Deal
†Hope, A. J. B. Beresford, M.P....Bedgebury Park, Cranbrook
†Hughes, Hugh...Brightling, Hawkhurst
Jackson, A....Orpington, St. Mary Cray
Jackson, Thomas...Eltham Park
Jacob, W....Shepherd's Well, Dover
James, Sir W. C., Bart....Betteshanger, Sandwich
†Kelsey, Edwin...Wickhambreux, Sandwich
Kennard, D. F....Wester Hill, Linton, Maidstone
Kibble, Thomas...Green Trees, Tonbridge
†Kingsnorth, Alfred...Great Chart, Ashford
†Kingsnorth, Edward...Brookland, New Romney
Kirkpatrick, Captain J....Monks Horton, Hythe
Kirkwood, Captain...Gore Court, Maidstone
Knight, Richard...Bobbing Court, Sittingbourne
Knight, Richard Lake...Bobbing, Sittingbourne
†Lake, Edward...Hill Side, Strood
Lake, Frederick...Rodmersham, Sittingbourne
Lake, J...Newlands, Teynham, Sittingbourne
†Lake, Robert...Oakley, Rochester
†Lake, Thomas...Tonge, Sittingbourne
Langridge, George...Lansdowne Road, Tunbridge Wells
Larking, J. Wingfield...The Firs, Lee
†Laurence, W....Elsfield House, Maidstone
†Leese, C. Stuart...Divan Court, Faversham
Leigh, Roger...Barham Court, Teston, Maidstone
Leney, Edward...Hadlow Place, Tonbridge
Leney, Frederick...Wateringbury, Maidstone
Lennard, Colonel J. F....Wickham Court, Bromley
Levett, William...Glassenbury, Cranbrook
Love, Peter...Silverstead Lodge, Westerham Hill, Kent
†Loyd, Lieut.-Col. E....Lillsden, Hawkhurst
Mace, J. Ellis...Ashford Road, Tenterden
Mac George, John...Great Chart, Ashford
†Maitland, Colonel...Hollywych, Edenbridge
†Mannington, A....Staplecross, Hawkhurst
†Mannington, D....Hellingby Park, Hawkhurst
Mannington, Isaac...Ewhurst, Hawkhurst
Manwaring, T...Mare Place, Brenchley, Staplehurst
Marsham, George...Hayle Place, Maidstone
Marten, John...Chilham, Canterbury
Marten, Peter...Bridge Street, Canterbury
†Martin, P. Wykeham, M.P...Leeds Castle, Maidstone
†Matthews, Joseph...St. Lawrence Seal, Sevenoaks
May, John...Farningham, Dartford
Maylam, William...Pluckley, Ashford
Mercer, W....Grove House, Hunton, Staplehurst
Mills, Sir C. H., Bt., M.P....Wilderness, Sevenoaks
†Mills, J. R....Kingswood Lodge, Tunbridge Wells
Miskin, William...Hoo, Rochester
Mold, William Henry...Bethersden, Ashford
Monckton, Frederick...The Cage Farm, Tonbridge
†Monins, J. H....Ringwood, Dover
Moon, J. S....Starborough Castle, Edenbridge
†Moore, Rev. Edward...The Precincts, Canterbury
†Moore, Rev. G. Bridges....Tunstall, Sittingbourne
Morland, W. Courtenay..The Court Lodge, Lamberhurst
†Morley, H. Hope...Hall Place, Tonbridge
Morrish, G. M....Park Gate Farm, Chelsfield
Murton, Frederick...Smeeth, Ashford
†Neame, Charles...Copton, Faversham
†Neame, Edward...Selling Court, Faversham
†Neame, Edwin...Harefield, Selling, Faversham
Neame, Frederick...Lutton, Selling, Faversham
†Neame, Frederick, jun....Throwley Parsonage Faversham
Neame, Percy B....The Mount, Ospringe, Faversham
Neame, Robert...Boughton Blean, Faversham
†Nettleingham, F. B....4, Marine Parade, Gravesend
Neve, Charles..Amberfield, Chart Sutton, Staplehurst
Neve, George...Sissinghurst, Staplehurst

†Neve, Richard...Benenden, Staplehurst
†Neve, Thomas...Sissinghurst, Staplehurst
Neville, Ralph P....Birling Manor, Maidstone
Noakes, Charles...Polding, Maidstone
†Noakes, John T....Brockley House, Lewisham
†Norman, G. Warde...Bromley
†Page, Henry...Walmer Court, Walmer
†Paine, Jeremiah ..Sutton Valence, Staplehurst
†Paterson, Richard...Leesons, Chislehurst
Pawsey, Arthur...Sandwell House, Lewisham Road
Peppercorne, Henry...East Malling, Maidstone
Perkins, Thomas...Wellesborough, Ashford
Perkins, William...Brabourne, Ashford
Phelps, H. G. Hart...Ridley Parsonage, Wrotham
Phillips, Thomas...West Malling, Maidstone
Philpott, Thomas...Linton, Maidstone
Phipps, Filmer...River, Dover
Pine, Frederick...West Tree Villa, Maidstone
Pine, Robert...Trosley Court, Maidstone
Plumptre, Charles J....Pedding House, Sandwich
Plumptre, J. Bridges..Goodnestone Farm, Wingham
Prentice, Edward...Chalk, Gravesend
Prentis, W. T....Maidstone
Pryce, Frederick...The Bank, Darrington, Faversham
Pryke, J. P....Aldersfield Hall, Wickhambrook
†Punnett, P. S....Breakspear Road, New Cross
Purvis, Charles...Foxgrove Farm, Beckenham
†Pye, Henry...St. Mary's Hall, Rochester
Pye, James...Knight Place, Rochester
Rammell, W. Lake...Sturry Court, Canterbury
†Ramsbotham, F...Crowborough Warren, Tunbridge Wells
Ratcliffe, Charles ...Womanswold, Canterbury
Reeves, Thomas...Staplehurst
Reeves, William...Paley, Cranbrook
Rice, E. Royd...Dane Court, Wingham
Rigden, Henry...Lyminge, Hythe
Rigden, Henry...Saltwood Castle, Hythe
Robinson, John...Wingham, Sandwich
Rolfe, G. C....Plumpton, Wye, Ashford
Romney, Earl of...The Mote, Maidstone
Russell, George...Manor House, Plumstead
Russell, Joseph...Pudding Lane, Maidstone
Russell, Robert...Horton Court Lodge, Dartford
Rutherford, T. B....Hothfield, Ashford
Ruxton, G. F. Symonds..The Crook Farm, Brenchley, Staplehurst
Sackville, Lord...Knowle, Sevenoaks
†Salomons, Sir D. L., Bt....Broom Hill, Tunbridge Wells
†Sandford, Marks...Hever Lodge Farm, Edenbridge
†Sankey, R. J....Dent-de-Lion, Margate
Scott, Alfred...Boys Hall, Willesborough, Ashford
Scott, John...Wouldham, Rochester
Scratton, John...Court Lodge, Shorne, Gravesend
†Selmes, J....Nevenden, Ashford
Seymour, R. A....43, Kingsley Road, Maidstone
Shafto, T. D....Chevency House, Hunton, Maidstone
Sharpe, W. Burling...Baker's Cross, Cranbrook
Smith, G. Fereday...Grovehurst, Tunbridge Wells
Smith, W. B....New Romney, Folkestone
Smithell, R. Hudson...Hengrave House, Margate
Solly, G. B....Monkton Court, Ramsgate
Sondes, Lord...Lees Court, Faversham
†Springett, Augustus...Ashfield Lodge, Hawkhurst
Startup, T. W....West Farley, Maidstone
Still, George...Rayham, Eastchurch, Sheerness
†Stilwell, A. F....Sheperdswell, Dover
Stirling, Sir W., Bart...Burrs Wood, Tunbridge Wells
Stone, John J....14, Wickham Road, Lewisham High Road
Stonham, Henry...Thornham, Maidstone
Stratton, Rev. J. Y....Ditton Rectory, Maidstone
Stunt, Frederick...Highams, Rochester
Stunt, Warwick...Hoo, Rochester
†Stunt, W. C....Brogdale, Ospringe, Faversham
Sturgess, Thomas...Penshurst, Tonbridge
Style, A. F....Hayle Cottage, Maidstone
†Swinford, Stephen...Strode Place, Herne, Canterbury
Sydney, Earl...Frognal, Foot's Cray
Talbot, J. Gilbert, M.P....Falconhurst, Edenbridge
Tattersall, Rev. W....Charlton Place, Bishopsbourne
Taylor, W....Wickham Court Farm, Beckenham
Taylor, William...Lenworth House, Maidstone
Tebb, R. Palmer...Crystal Palace Park, Sydenham
Theobald, Hope...Lympne, Hythe
Townend, Thomas...Knockholt
Tunbridge Wells Farmers' Club, Secretary of
Tye, James...Rose Villa, Cranbrook
Tylden-Pattenson, Captain...Ibornden, Biddenden, Staplehurst
†Tylden-Pattenson, W. B...Dashmonden, Biddenden
Tyser, G. D....Hollanden Park, Tunbridge
†Umfreville, S. C....Ingress Abbey, Greenhithe
†Waldo, E. W. Meade...Stone Wall, Edenbridge
Walker, W. H....Rainham, Sittingbourne
†Wall, William H....Pembury, Tunbridge Wells
Walter, William...Rainham, Sittingbourne
Warde, Ambrose...West Farleigh, Maidstone
Waring, William...Chelsfield
Waterman, James, jun....Tenterden, Ashford
Watts, G. J....Radlett, Bromley Common
Webb, Henry...Tunstall, Sittingbourne
Wedd, E. A....Great Wakering, Southend
Weeks, W....Maidstone
Whibley, F. W....Standens Farm, Sevenoaks
White, Alfred...Nettlestead Court, Maidstone
White, E. A....Beltring, Tonbridge
White, George...Hunton, Maidstone
White, J. Baker...Street End House, Canterbury
†Whitehead, Charles...Barming House, Maidstone
Whitehead, John...West Barming, Maidstone
Whitehead, Richard...West Farleigh, Maidstone
Wickham, Benjamin...Goudhurst
Wigan, Lewis D....Oakwood, Maidstone
†Wigg, John S....Stoneleigh, Tunbridge Wells
Wilkie, E. Hales...Ellington House, Ramsgate
†Willett, Harry...Laughton, Hawkhurst
Willmot, B. S....Eridge House, Tunbridge Wells
†Wilson, Edward...Hayes, Bromley
†Wilson-Haffenden, Rev. J....Homewood, Tenterden
Winch, Henry...Mears Court, Rainham
Wood, John...Singlewell, Gravesend
Woodhams, Frank...Frindsbury, Rochester
Wyld, John...Spitzbrook, Staplehurst
Wyles, Thomas...Frindsbury, Rochester
Yardley, Sir William...Hadlow Park, Tunbridge

LANCASHIRE.

Governors.

†Brooks, W. Cunliffe, M.P...Barlow Hall, Manchester
Devonshire, The Duke of, K.G....Holker Hall
†Ellesmere, Earl of...Worsley Hall, Manchester
†Sefton, Earl of....Croxteth, Liverpool
†Skelmersdale, Lord...Lathom House, Ormskirk
Winmarleigh, Lord...Bank Hall, Warrington

Members.

Alcock-Beck, William...Outgate (Windermere)
Allen, J. F...Sutton Works, Peasley Vale, St. Helens
†Anderton, Richard...West Derby, Liverpool
Ashburner, G....Low Hall, Kirby Irleth, Carnforth
Ashburner, John ..Elliscales, Dalton-in-Furness
†Ashburner, Robert...Gleaston Park, Ulverston
Ashcroft, Daniel...Haigbton, Preston
†Ashcroft, James...Oakhill Park, Old Swan, Liverpool
†Ashworth, Alfred...Egerton Hall, Bolton
Ashworth, Charles E....Fairfield, Manchester
Atherton, Richard...Speke, Liverpool
Baker, Hugh M....7, Talbot Street, Liverpool
†Baldwin, W. J. A....Dalton-in-Furness
†Barton, J....West Leigh Lodge, Leigh, Manchester
Bass, W....Duckenfield Lodge, Ashton-under-Lyme
Bate, John...Fallowfield, Manchester
Becker, J. L....Foxdenton, Chadderton, Manchester
Bell, Alexander...Barrowford, Nelson, Burnley
Betham, John...Southport, Lancaster
†Birchall, Thomas...Ribbleton Hall, Preston
Blackburne, Lt.-Col. Ireland...Hale Hall, Warrington
Blundell, P....Ream Hills, Weeton, Kirkham
†Boddington, Henry...Monton House, Eccles
Booth, John...Slyne Grange, Lancaster
†Bouck, John T....Manchester
Bradford, William...Reddish Hall, Warrington
Brierley, Charles W....Drinkwater Park, Manchester
†Brocklebank, Thomas...Springwood, Woolton, Liverpool
Brogden, Alexander, M.P....Ulverston
Brogden, J. G....Kentsford Grange, Carnforth
Bromley, James...Forton, Garstang
Bromley, John...Lancaster
†Butler, Thomas...Dalton-in-Furness
†Cameron, A. H. F....Sheil Road, Liverpool
Carruthers, G. B...Westbourne Terrace, Lancaster
Carter, George R....Bolton
Castellain, Alfred...Liverpool
Catterall, Paul...Lytham, Preston
Catterall, Robert...Kirkham, Preston
†Chadwick, F....The Hermitage, Grimsargh, Preston
†Chadwick, James...Prestwich, Manchester
Chandler, Henry...Salford, Manchester
†Chorlton, W. M....Old Hall, Withington, Manchester
†Clare, C. Leigh...Higher Broughton, Manchester
Clarke, W. B...Barwickstead, Beckermet, Carnforth
Clifton, Thomas H....Lytham Hall, Lytham
†Clowes, Edmund....Carnforth
†Cookson, John...The Firs, Stretford
Cradock, George...2, Wilton Parade, Blackpool
Cragg, W. Smith...Arkholme, Carnforth
Cranke, John...Fountain Street, Ulverston
†Cranke, M. J....Midtown, Urswick, Ulverston
Craven, James...Whalley Range, Manchester
Crook, Thomas...Chesham House, Garstang
†Cropper, E. W....Moss Bank, Aughton, Ormskirk
Cross, John...78, Cross Street, Manchester
†Cross, William A....Red Scarr, Preston
Crosse, Thomas B....Shaw Hill, Chorley
Croudson, John...Urswick, Ulverston
Culshaw, Joseph...Towneley, Burnley
Cunliffe, Major Ellis...Queen Street, Lytham
Davies, Benjamin...Hayton House, Chorley
†Deakin, J....Eller How, Lindale, Grange
†Derby, Earl of...Knowsley Hall, Prescot
†De Trafford, Sir H., Bt....Trafford Park, Manchester
†De Trafford, J. R....Croston Hall, Croston
Dobell, G. C....10, North John Street, Liverpool
†Dodson, Charles E....Littledale Hall, Lancaster
Dorendorff, R....85, Bridge Street, Manchester
†Drewry, George...Holker, Grange
Dugdale, Adam...Rose Hill, Burnley
Dugdale, Edward...Park Hey, Blackburn
Dyer, Lieut.-Col....44, Chorlton Street, Manchester
†Earle, Frederic W....Edenhurst, Prescot
Eastwood, George...Healey Hall, Burnley
Eckersley, James...Burnt House, Chorley
Eckersley, Nathaniel...Standish Hall, Wigan
Eden, Peter...Cross Lane, Salford
Edmondson, B....Lower Hood House, Burnley
Edmondson, T. G....Gresgarth Hall, Lancaster
Ellis, Francis...Trafford Park, Manchester
†Entwistle, John S....Foxholes, Rochdale
†Evans, W. L....Fazakerley House, Prescot
Fair, Jacob W....Lytham
Fair, Thomas...Westwood, Lytham
†Fenton, Joseph...Bamford Hall, Rochdale
†Fenton, William...Beaumonds, Rochdale
†Fielden, John...Dobroyd Castle, Todmorden
†Fielden, Joshua, M.P...Stansfield Hall, Todmorden
†Fielden, Samuel...Centre Vale, Todmorden
Fisher, John...Layton Hall, Blackpool
Foulkes, John...The Sycamore, Lymm, Warrington
Follows, F. W....Victoria Crescent, Eccles
Gaitskell, Jacob...Hall Santon, Holmrook, Carnforth
Gaitskell, John...Hall Santon, Holmrook, Carnforth
†Gamble, David...Gerrard's Bridge, St. Helen's
Garnett, Robert...Wyreside, Lancaster
†Garnett, W....Quernmore Park, Lancaster
Garnett, William...Bashall Lodge, Clitheroe
Gerrard, John...Adlington, Chorley
Gillow, Richard C....Leighton Hall, Lancaster
†Gladstone, R....Court Hey, Broad Green, Liverpool
†Gorst, William...Garston, Liverpool
†Graham, Rev. P....Turncroft, Darwen
Greatorex, Frederick...Queen's Brewery, Manchester
†Greenall, Sir Gilbert, Bart., M.P....Walton Hall, Warrington
†Greene, Col. Dawson...Whittington Hall, Carnforth
Halsall, John...Hale Bank, Widnes
†Hannay, R....Springfield, Ulverston

Hare, Theodore J....Crooke Hall, Chorley
Hargreaves, E. H....Kirkham
Harper, William...Bury
Harrison, John...48, Irwell Street, Widnes
Harrison, Joseph...2, Central Beach, Blackpool
†Harrison, W....Samlesbury Hall, Preston
†Haslam, John P....Gilmow House, Bolton
Haster, Percival L. I....4, Park Street, Lytham
Hathornthwaite, W....Yealand, Carnforth
Heaton, Captain H....Worsley, Manchester
†Heywood, A....West Derby, Liverpool
†Hibbert, Henry...Broughton Grove, Grange
Hibbert, Thomas J....Grange-over-Sands,Carnforth
Holliday, James...Lord Street, Liverpool
†Hollings, James C....Astley Bridge, Bolton
Horsfall, Thomas...Hollin Bank, Briarfield, Burnley
†Horton, William T....Embsay Kirk, Skipton
Howorth, James...Farnworth
†Hubback, Joseph...Liverpool
†Hunt, George...Ingol Cottage, Preston
Hurst, Robert...Baillie Street, Rochdale
†Ingram, Joseph...Beauford Grange, Sale, Manchester
Inman, H....Rose Bank, Stretford, Manchester
†Jackson, James*..Oakenclough, Garstang
Jackson, James...6, Chapel Street, Preston
Jackson, James...Stalmire, Poulton-le-Fylde
†Jackson, Joseph...Calder House, Garstang
†Jackson, Thomas...Newsham Hall, Preston
Jacson, C. R....Barton, Preston
Jones, R. W....24, Norfolk Street, Liverpool
Jeffreys, R....Ormskirk
†Kendall, James...Harbarrow, Ulverston
†Kennedy, Myles...Burton Cottage, Ulverston
Knight, John...Farnworth, Warrington
†Knowles, James...Eagley Bank, Bolton
Lambe, John...Hopefield, Eccles, Manchester
Law, J. H....Woodwell, Silverdale, Carnforth
Lewthwaite, William...Broad Gate, Broughton-in-Furness
Littledale, Harold...Liscard, Liverpool
†Mallinson, John ... Bury Old Road, Cheetham, Manchester
Marsh, John...Bradley Hall, Grappenhall, Warrington
†Marsland, W....Baguley Hall, Northenden
Mayman, B....Water Street, Liverpool
Meller, J. Galloway...22, Cooper Street, Manchester
†Mercer, William...Newton, Warrington
†Miller, T. Horrocks...Singleton, Poulton-le-Fylde
Miller, W. P....Winckley Square, Preston
Milner, John...Theales, Kirkham
†Morgan, George...11, College Lane, Liverpool
†Morris, J. G....Allerton Priory, Woolton, Liverpool
Mould, G. W....Cheadle, Manchester
Moult, William...Knowsley, Prescot
†Mucklow, Edward...Castle Head, Grange
Muirhead, T....20, Victoria Street, Manchester
†Musgrove, Edgar...West Town, Ormskirk
Musson, Joseph ..Holt Hill House, Whiston Prescott
Neild, Henry...The Grange, Worsley, Manchester
Neilson, Robert...Halewood, Liverpool
Nevell, Thomas...18, Winckley Street, Preston
†Newall, Henry...Hare Hill, Littleborough
†Ockleston, W. F....Cheadle, Manchester
†Ormandy, W. W....Beckside, Pennington, Ulverston
†Ormerod, H. M....5, Clarence Street, Manchester
Owen, R. J....Halewood, Liverpool
†Park, James...Lightburne, Ulverston
†Parker, B....Caerden Hall, Preston
Parker, Thomas...Hyde Road, Waterloo, Liverpool
Parker, T. Sumner...Aughton Brewery, Ormskirk
Parker, T. Townley...Lytham
†Parr, Cecil F....Grappenhall Hayes, Warrington
†Parr, F. Charlton...Grappenhall Hayes, Warrington
Pearson, F. F....Storrs Hall, Arkholme, Carnforth
Pearson, Thomas...Nateby, Garstang
Pearson, William...20, Miller's Buildings, Lancaster
Peck, John H....Wigan
†Peel, Jonathan...Knowlmere Manor, Clitheroe
Percival, T....Moss Side, Moore, Warrington
Pilkington, George...Stoneleigh Liverpool
Platt, William...Wigan
Polding, James Bede...Burnley
Porter, Wm....Wyre Bank, St. Michael's, Garstang
†Ratcliffe, Daniel R....Mossley Hill, Liverpool
Rawlinson, Robert...Graythwaite, Ulverston
†Rawstorne, Lawrence...Hutton Hall, Preston
†Reed, George, M.D....Royal Infirmary, Manchester
Reynolds, R. S....Smithdown Lane, Liverpool
†Richardson, George...Halewood, Liverpool
Rigby, Thomas...Lea Old Hall, Preston
†Riley, Hamlet...Lundenden Fort, Manchester
Robinson, Dixon...Clitheroe Castle
Robinson, J....Huggart's Farm, Brindle, Chorley
Robinson, R. C....Albert Works, Preston
Robinson, W....Darlington Lodge, Warrington
Robinson, William...The Gill, Ulverston
†Rodgett, John...Darwen Bank, Preston
†Rothwell, R. R....Sharples Hall, Bolton
†Royds, A. Hudson...Falinge, Rochdale
†Royds, Henry...Wavertree, Liverpool
†Royds, Rev. John...Heysham Rectory, Lancaster
†Schroder, Baron W...12, Rumford Place, Liverpool
Scotson, William...Aigburth, Liverpool
Seddon, R. B....The Firs, Hindley, Wigan
Sharman, S....Little Crosby, Liverpool
†Shaw, James...Scarisbrick, Ormskirk
Shaw, Thomas...Mawdesley, Ormskirk
†Shuttleworth, Sir U. Kay, Bart., M.P....Gawthorpe Hall, Burnley
Silcock, R....Thornton Hall, Poulton-le-Fylde
Singleton, John...Stalmire, Poulton-le-Fylde
Skirving, William...15, Queen Square, Liverpool
†Slater, George...Park Farm, Dalton-in-Furness
Slater, William...Park, Dalton-in-Furness
Slye, Joseph...11, Westbourne Terrace, Lancaster
Smith, A. M'Kenzie...Kent Street, Liverpool
Smith, Joseph...Cable Street, Lancaster
†Smith, R. C....Parkfield, Swinton, Manchester
Southern, John...Culcheth, Warrington
Spinks, John M. B....Knotty Ash, Liverpool
†Spurrier, Henry...Kersal, Manchester
†Standish, W. S....Duxbury Park, Chorley

Stanley, Edward...The Height, Grange
†Stanley, Lieut.-Col. the Hon. F. A., M.P...Witherslack Hall, Grange, Carnforth
†Starkie, Major...Huntroyde, Burnley
†Starkie, John P. C., M.P...Ashton Hall, Lancaster
Statter, G. F....Park House, Whitefield, Manchester
Statter, T., jun....Stand Hill, Whitefield, Manchester
Stocks, Charles...Cheadle, Manchester
Storey, Capt. Joseph...Moorside, Lancaster
Sykes, James...Breckhouse, Poulton-le-Fylde
Sykes, J. G....78, Rodney Street, Liverpool
Tatton, T. W....Wythenshawe Hall, Northenden
†Taylor, Samuel...Eccleston Hall, Prescot
Thom, John...Larkhill, Chorley
†Thompson, F. B....Elmsfield, Gatacre, Liverpool
Thompson, Richard H....Broughton, Preston
Thompson, Robert...Mythop Lodge, Weston, Blackpool
Thornton, Richard...Primrose Hill, Nateby, Garstang
†Tinne, John A...Briarley, Aigburth, Liverpool
Tod, A. J....Woolton Grange, Liverpool
†Townend, John...Shadsworth Hall, Blackburn
†Tunstall, James...St Michael's, Garstang
Vickers, Thomas...Cheetham Hill, Manchester
†Wadham, E....Mill Wood, Dalton-in-Furness
†Walker, Ormerod O....Chesham, Bury
Walker, William T....Clapham, Lancaster
Warburton, Thomas S....Charmley Street, Preston
†Whalley, C. L...Richmond House, Lancaster
Whalley, R....Mill Green, Bold, Warrington
Whitworth, H....96, King Street, Manchester
Whitworth, Sir J...The Firs, Fallowfield, Manchester
Wilkinson, Thomas...Gift Hall, Garstang
Willacy, Robert...Penwortham Priory, Preston
†Willis, H. R. D'Anyers...Halsmead, Prescot
†Wilson, A. W....Belmont, Ulverston
†Wilson, T. Newby...The Landing, Ulverston
Wilson, Thomas...Underbarrow, Milnthorpe
Winder, G. A....Tonge Moor, Bolton
Wood, James...Haigh Hall, Wigan
†Woodburne, Thomas...Thurston Ville, Ulverston
Woodhouse, John...Skale Hall, Lancaster
Woodroffe, W. S....Beamont Grange, Lancaster
Woods, Arthur...Aintree, Liverpool
Wright, John...Croxteth Park, Liverpool
†Wright, Richard...Whalley Range, Manchester

LEICESTERSHIRE.

Members.

Addison, J....Rockingham, Leicester
Allen, Thomas...Thurmaston, Leicester
Arkwright, A. W...Broughton Astley House, Lutterworth
Arthur, Col....Beauchamp Grange, Kibworth
Bailey, Edward...Leicester
Ball, George...North Kilworth (Rugby)
Barber, William...Congerstone (Atherstone)
†Barwell, Thomas...Leicester
Bassett, John C....Ullesthorpe, Lutterworth
Beale, John A....Brockhurst, Lutterworth
Berry, Edmund...Ashley, Market Harborough
Betterton, H. J....Thorndale House (Woodville, Burton-on-Trent)
Bland, T. H....Dingley Grange, Market Harborough
Brewitt, T. B....Sanham House, Melton Mowbray
†Brooke, Sir W. de Capel, Bt....The Elms, Market Harborough
†Brown, G. Fowler...Newtown, Desford, Leicester
†Bruxner, Rev. G. E., M.A....Thurlaxton, Hinckley
Bryan, Frederick T....Humberstone, Leicester
Burnaby, Colonel...Baggrave Hall, Leicester
Carver, Robert...Ingarsby, Leicester
Chenery, Edward H...Gadsley Hall, Melton Mowbray
Collins, Charles...Burbage, Hinckley
Cooper, Alfred Allen...The Hall, Wigston, Leicester
Creswell, R. W....Ravenstone, Ashby-de-la-Zouch
Crosland, J. S....Burbage House, Hinckley
Davis, John...Wykin Hall, Hinckley
Doubleday, E.,M.D...Long Clawson,Melton Mowbray
Eggleston, Edward J....Great Peatling, Lutterworth
Ellis, James...Glenfield, Leicester
Everard, William...Narboro', Enderby, Leicester
Farnham, E. B....Quorndon House, Loughborough
Fisher, E. Knapp...Market Harborough
Fowke, Sir F. T., Bart....Lowesley Hall, Leicester
Foxwell, Edwin J....Manor House, Hinckley
Freer, Charles T....The Coplow, Billesdon, Leicester
German, George...Normanton-le-Heath, Ashby-de-la-Zouch
German, John...The Common, Ashby-de-la-Zouch
Godfrey, John...Wigston Parva, Hinckley
Goodchild, Philip...Glen Parva, Leicester
Hack, Matthew...Leicester
Hall, W. Henry...Peatling Magna
Hamel, A. John...London Road, Leicester
Harris, John Dove...Knighton, Leicester
Harrison, J....New Found Pool, Leicester
†Harrison, John...The Willows, Leicester
Hassell, Joseph...Great Wigston, Leicester
Hazlerigg, Sir A. Grey, Bart...Noseley Hall, Leicester
Henson, William...Burtonfields, Hinckley
†Holford, Thomas...Papillon Hall, Market Harborough
†Hoskyns, Rev. H. J....Blaby Rectory, Leicester
†Humphreys, Henry...Wood House, Loughborough
Islip, F. W....Collegiate House, Leicester
Ison, Edward...Ashby-de-la-Zouch
Johnson, T. F....Stoneygate, Leicester
Johnson, Walter F....Leicester
Kemp, Francis...Saddington, Market Harborough
Key, William H....Enderby Grange, Narborough, Leicester
†King, R. F....Coalville, Leicester
Leadbeater, J. B..Thorpe Satchville, Melton Mowbray
†Low, A....Smockington House, Hinckley
†Marriott, C....Cotesback Hall, Lutterworth
Miles, Roger Dutton...Keyham, Leicester
†Morris, Thos., jun....Walcote Fields, Lutterworth
†Mowbray, Major...Overseal, Ashby-de-la-Zouch
Nuttall, Thomas...Manor House, Beeby, Leicester
Oldacres, Matthew...Clipston, Market Harborough
†Paget, G. E....Sutton Hall, Loughborough

†Paget, T. T....Humberstone
Painter, Robert...23, Humberston Gate, Leicester
Pilgrim, S. C....The Outwoods, Hinckley
Pochin, Capt....Braunston House, Leicester
Porter, Henry...Wanlip, Leicester
Richards, W....Belgrave, Leicester
Rolleston, J. F. L....Grey Friars, Leicester
†St. Maur, Lord A....Burton, Loughborough
†Salt, Sir William H., Bart....Maplewell, Loughborough
Sarson, John...Welford Place, Leicester
Scott, W....Normanton Turville, Hinckley
Scotten, Richard J....Monks' Kirby, Lutterworth
Shakespears, John...Copson Magna, Hinckley
†Sharman, Warren...Melton Mowbray
†Simpkin, Joseph...Narborough, Leicester
Standbridge, Thomas...Aston Flamville, Hinckley
†Stratford, H. S....Thorpe Lubenham, Market Harborough
†Tailby, W. Ward...Skeffington Hall, Leicester
Taylor, John...Belgrave Gate, Leicester
Vavasour, M. W....Overseal, Ashby-de-la-Zouch
Vipan, J. V....Portland Terrace, Leicester
†Voile, Thomas...Frolesworth, Lutterworth
Warner, Thomas...The Abbey, Leicester
†Wartnaby, Mrs....Market Harborough
Watson, James R....Ashley, Market Harborough
Woodcock, H. C....Rearsby, Leicester
Woodcock, T....Rothbury, Loughborough
†Woolley, William E....Loughborough
Worswick, Major...Normanton Hall, Hinckley
Wright, Thomas...Wanlip, Leicester
Wright, William...Shoby Priory, Melton Mowbray

LINCOLNSHIRE.

Governors.

Astley, Lt.-Col. Sir J. D., Bt....Elsham Hall, Brigg
Aveland, Lord...Normanton Park, Stamford
Chaplin, Henry, M.P....Blankney Hall, Lincoln
Exeter, Marquis of, K.G....Burleigh House, Stamford
†Rutland, Duke of, K.G....Belvoir Castle, Grantham

Members.

†Alington, G. M....Swinhope House, Grimsby
Allen, Edward...Sleaford
Anderson, J. C....Avenue Farm, Long Sutton
Ashton, William...Horncastle
Amcotts, Colonel, M.P....Hackthorn Hall, Lincoln
Bartholomew, Francis W.....Waddington Heath, Lincoln
Barwell, Thomas...Spalding Common
Battle, John R....Potter Hanworth, Lincoln
Bell, Ancill...Manor House, North Kyme, Sleaford
Beridge, Rev. Basil...Algarkirk, Spalding
†Bettinson, Richard...Thurlby, Bourne
Bland, George...Coleby Hall, Lincoln
Bonnall, John...Grantham
Borman, Joseph...Irby Mount, Caistor
Bourne, Thomas C....Eastgate Lodge, Lincoln
†Bramley, Charles...Fiskerton Hall, Lincoln
Briggs, D. Grant...Kelstern Grange, Louth
Brown, Pereira...Glentworth Hall, Lincoln
Burkill, E. W...Winteringham, Brigg
Burrows, C. P....Misterton, Gainsborough
Byron, John...Kirby Green, Sleaford
Caborn, Richard S....Denton, Grantham
Campain, Joseph George...Cowbit, Spalding
Campain, S. W....Deeping St. Nicholas, Spalding
Cartwright, F....Temple Grange, Grantham
Cartwright, T....Pillar Farm, Dunston, Lincoln
Casswell, George...Gosberton, Spalding
Casswell, John Henry...Laughton, Folkingham
Cave, Henry Haddon...Brigg
Cheavin, George...Boston
†Clarke, Charles...Ashby-de-la-Launde, Sleaford
†Clayton, Nathaniel...Newland House, Lincoln
Coates, Thomas...Ravendale, Grimsby
Conington, Clement...Hagworthingham, Spilsby
†Constable, J. Goulton...Walcot, Brigg
Corringham, R. W....Lound House, Haxey (Bawtry)
Coultas, James, jun....Spittlegate, Grantham
Coupland, John G....Freeston, Boston
†Crawley, John, jun....Manor House, Holbeach
†Crofts, Rev. C. D....Caythorpe Rectory, Grantham
Dalton, T. B....Storton Scawby, Brigg
Dean, W. Worth...Horbling, Folkingham
†Dixon, John William...North Owersby, Market-Rasen
†Dixon, Thomas Parkinson...Caistor
Duckering, Charles E....Northorpe, Kirton Lindsey
Dudding, Henry...Panton House, Wragby
Dudding, William...Lambcroft, Louth
†Ellison, Major R. G....Boultham Hall, Lincoln
Epton, Robert J....Newball, Lincoln
Everington, W., jun....Skegness, Burgh-le-Marsh
Fane, Colonel F....Fulbeck Hall, Grantham
†Fieldsend, Charles R....Kirmond, Market Rasen
Finch-Hatton, Hon. M. E. G....Haverholme Priory, Sleaford
Fox, George M....High Street, Lincoln
Fox, William...Brook Farm, Dunston, Lincoln
Frankish, William...Limber Magna, Ulceby
†Fytche, J. Lewis...Thorpe Hall, Elkington, Louth
†Garfit, Arthur...Scothern, Lincoln
Ghest, William...Barlings Manor, Wragby
Gibbons, Joseph...Caduey, Brigg
†Gibson, John Kirk...Ingleby, Lincoln
Gibson, Thomas...Stamford
Grantham, Lieut.-Col. H. V.....West Keal Hall, Spilsby
†Greenham, James...Blankney, Lincoln
†Greetham, John...Stainfield Hall, Wragby
Hack, Algernon...Buckminster, Grantham
Hallifield, W....Misterton, Gainsborough
Harris, Edward...Horbling Vicarage, Folkingham
Hayes, Henry...Stamford
Hayward, Charles J....Sherborne House, Lincoln
Hayward, C. P....Beaumont Manor, Lincoln
†Heneage, Edward...Hainton Hall, Wragby
Hessletine, W...Beaumont Cote, Barton-on Humber
Hett, Charles L....Brigg.

Hill, Joshua...Poolthorne, Brigg
Hilliam, Captain T....Willesby Hall, Spalding
Hobson, John George...Curlew Lodge, Long Sutton
Holland, James...Deeping St. Nicholas, Spalding
Holland, John Wells..Deeping St.Nicholas, Spalding
Holland, William...Market Deeping
†Horner, James B....Lincoln
†Hornsby, James...Eastgate House, Grantham
†Hornsby, William...Elsham House, Grantham
Howard, E. J....Rise Farm, Nocton, Lincoln
Howard, R. G. F....Temple Bruer, Lincoln
†Hurdman, J. E...Mareham-le-Hill, Horncastle
†Jarvis, G. K....Doddington Hall, Lincoln
Jeffery, G. E....Rutland Works, Stamford
Jekyll, John...Newland, Lincoln
Johnson, G. W....Casewick Lodge, Stamford
†Kesteven, Lord...Casewick, Stamford
†Keyworth, H. J....Cottesford Place, Lincoln
†Keyworth, J. R. H....Greestone House, Lincoln
†King, John R....North Ormsby, Louth
Kirk, Charles...Sleaford
Kirkby, Thomas...Cuxwold, Caistor
Kirkham, John W....Cadeby Hall, Grimsby
Kirkham, Thomas...Biscathorpe House, Louth
Lincolnshire Agricultural Society, Secretary of
Lister, Charles...Coleby Lodge, Lincoln
†Livesey, Rev. T....33, Eastgate, Lincoln
†Locock, Edmund...South Elkington, Louth
Lowe, Septimus...Lincoln
†Lucas, Rev. C. H....Edith Weston, Stamford
†Lucas, Lieut. Col. R....Edith Weston, Stamford
Lupton, J....Haceby, Folkingham
Lynn, John...Church Farm, Stroxton, Grantham
Mackinder, Harwood...Langton Grange, Spilsby
Mackinder, Herbert...Mere Hall, Lincoln
Mackinder, Robert...Langton, Spilsby
Macvicar, Neil...Kirmond, Market Rasen
†Maddison, G. Wilson...Partny, Spilsby
Marris, Thomas...Ulceby
†Marshall, Frederick C....Riseholme, Lincoln
Marshall, Frederick R....Elsham, Brigg
Marshall, James...Gainsborough
Marshall, William F....Branston Villa, Lincoln
Martin, David...Wainfleet
†Martin, George...Hubert's Bridge, Boston
†Martin, James...Wainfleet
†Martin, Robert...Asterby, Horncastle
Mason, W. N....Rigsby, Alford
Melville, Hon. A. Leslie...Branston Hall, Lincoln
†Melville, A. S. Leslie...The Longhills, Lincoln
†Melville, C. Leslie...Branston Hall, Lincoln
Mundy, C. J. Massingberd..Old Bolingbroke, Spilsby
†Nainby, C. M....Barnoldby-le-Beck, Grimsby
Needham, J. L....Hutloft Grange, Alford
Nelson, John...Kettleby Thorpe, Brigg
†Nelson, John...Wytham House, Louth
Nicholson, F. F....Stainwells, Brigg
Nidd, C. W....Creeting Manor Farm, Stamford
Paddison, Charles F....Stableford (Newark)
Paddison, Edward...Ingilby, Lincoln
Palethorpe, Thomas...Sausthoppe, Spilsby
†Palmer, Rev. P. H.....Wolsthorpe, Grantham
Pears, John...Mere, Lincoln
†Pears, Thomas...Hackthorne, Lincoln
Pigott, Thomas...Barton-on-Humber
Pigott, William...Brigg
Plowright, C. H....Deeping St. Nicholas, Spalding
Plowright, T. J....The Hall, Pinchbeck, Spalding
†Pogson, F. M....Caythorpe, Grantham
Pogson, S. M....Anwick, Sleaford
Porter, J. T. B....Lincoln
Pratt, Frederick...Greatford, Stamford
Proctor, H. M....Hill House, Wykeham, Spalding
Reynolds, W. S....Spalding Common
Richardson, John...Lincoln
Richardson, William...Limber Magna, Ulceby
Robey, Robert...Lincoln
Robinson, Henry...Hough-on-the-Hill, Grantham
Robinson, James...West Pinchbeck, Spalding
†Robinson, John C...Freeston, Caythorpe, Grantham
Robinson, R., sen....Sedgebrook, Grantham
Robson, James...Brackenborough, Louth
Ruston, Joseph...Lincoln
†St. Albans, Duke of...Redbourn Hall, Brigg
Sanson, Edward F....Lincoln
†Seels, Henry John...Wainfleet Hall
Sharpe, William...Mavis Enderby, Spilsby
†Sharpe, W. Taylor...Baumber Park, Horncastle
†Sharpley, Coates...Kelstone Hall, Louth
†Sharpley, Henry...Acthorpe, Louth
†Sharpley, Isaac...Boswell House, Louth
Sheffield, Sir R., Bart....Normanby, Brigg
†Shuttleworth, Alfred...Heighingham Hall, Lincoln
†Shuttleworth, Joseph...Hartsholme Hall, Lincoln
†Sills, W....Casthorpe, Grantham
†Simonds, J. Cabourne...Fishtoft, Boston
†Skelton, E. Dunkley...Sutton Bridge
Skipworth, G. B....Moorton House, Caistor
†Slator, Thomas...Boston
Smith, John T....Edith Weston, Stamford
†Smyth, William H....South Elkington, Louth
Snow, James M....Metheringham, Sleaford
Sorthwell, Rev. H. G....Rothwell Rectory, Caistor
Sowerby, Francis...Aylesby, Great Grimsby
Sowerby, John, jun....Beelsby, Grimsby
†Stanhope, J. Banks...Revesby Abbey, Boston
†Thorold, Sir J. H., Bart....Syston Park, Grantham
†Thorold, Richard...Weelsby Hall, Grimsby
†Tindall, Charles William..Aylesby Manor, Grimsby
†Tindall, J. W...Ashfield House, Branston, Lincoln
†Tomlinson, Bruce...Asgarby, Sleaford
Tomlinson, James...Lutton Marsh, Long Sutton
†Tonge, D. F....Wellington Foundry, Lincoln
Turner, John...The Grange, Ulceby
†Turnor, Christopher...Stoke, Grantham
†Turnor, Edmund, M.P....Panton Hall, Wragby
Tuxford, J. S....4, Skirbeck Terrace, Boston
Vincent, Thomas...Harlaxton, Grantham
†Webb, James...Melton Ross, Ulceby
†Webster, Robert...Peakirk, Market Deeping
Welby, J. Earle...Allington Hall, Grantham
Welby-Gregory, Sir W. Earle, Bart., M.P....Newton House, Folkingham
West, John...Melton Ross, Brigg
†Wheeler, W. H....Churchyard, Boston
†Wingfield, J. H. Lee...Tickencote Hall, Stamford

†Winn, Rowland, M.P....Appleby Hall, Brigg
†Wood, Bennett W....Humberstone, Great Grimsby
Wood, William...Halbrough, Ulceby
Wright, Robert...Nocton Heath, Lincoln
†Wyles, Robert...Little Ponton, Grantham
†Yates, Henry...North Parade, Grantham

MIDDLESEX.

Governors.

Allcroft, John D....108, Lancaster Gate, W.
†Cambridge, H.R.H. The Duke of, K.G....Gloucester House, Piccadilly
†Gibbs, Sir Brandreth...47, Half Moon St., W.
Gwynne, John...Kenton Grange, The Hyde, N.W.
Rigg, Jonathan..4, Chester Place, Hyde Park Square

Members.

†Acworth, Nathaniel B....The Hook, Northaw
Addison, John..6, Delahay Street, Westminster, S.W.
Alison, John...90, Lancaster Gate, W.
†Allender, G. M....31, St. Petersburgh Place, Bayswater, W.
†Amies, W. S....284, Liverpool Road, Islington, N.
Arabin, W. St. Julien...36, Grosvenor Square, W.
Arnold, James...35, West Smithfield, E.C.
Arnott, T. Reid..Bramshill, Harlesden Green, N.W.
Badcock, P....4, Aldridge Road Villas, Westbourne Park
Baillie, William H....43, Norfolk Square, W.
Baily, John...113, Mount Street, Berkeley Square, W.
†Baker, Cecil C . .2, Bloomsbury Place, W.C.
Banks, William...4, John Street, Bedford Row, W.C.
†Barclay, G. R....Oxford and Cambridge Club, S.W.
†Barker, H. B. R....University Club, Suffolk St., W.
Barnett, John...Coleraine House, Stamford Hill
Batt, William Henry...West Drayton, Uxbridge
Beale, E. J....237, High Holborn, W.C.
Beauchamp, Charles D....27, Lansdowne Crescent, W.
Beaumont, W. B., M.P....144, Piccadilly Terrace, W.
Bell, G. W....11, Pall Mall East, S.W.
Bell, Henry...3, Market Buildings, Charterhouse Street, E.C.
Bell, John M....490, Oxford Street, W.
Birch, W. P....5, Westminster Chambers, S.W.
†Birkbeck, Robert...20, Berkeley Square, W.
Blansbard, Richard...K 1, Albany, Piccadilly, W.
Blyth, H. A....94, Portland Place, W.
Blyth, James...2, Park Crescent, Portland Place
Boards, Edward...Edmonton, N.
Bower, Joseph J....42, Glasshouse Street, W.
Bradford, Thomas...142, High Holborn
Bramwell, F. J..37, Gt. George St., Westminster, S.W.
Brewster, J....Metropolitan Cattle Market, Islington
†Browne, C....5, Hilldrop Road, Camden Road, N.W.
Bruce, A. K....7, Catherine Street, Strand
Buckland, Thomas, jun....Wraysbury, Staines
Burgess, William...Holborn Viaduct, E.C.
Burn-y, George...Millwall, E.
Caird, James, C.B....3, St. James's Square, S.W.
†Calvert, Frederick...33, Upper Grosvenor Street, W.
Carson, J. A....La Belle Sauvage Yard, Ludgate Hill
†Cassavetti, A....6, Addison Road, W.
Chadwick, Alfred J....2, Moorgate Street, E.C.
†Chambers, W...United Univ. Club, Pall Mall, S.W.
Chapman, Thomas...14, Cockspur Street, S.W.
†Claridge, William...51, Brook Street, W.
Clarke, J. A....109, Ladbroke Grove Road, Notting Hill, W.
Clarke, T. Truesdale...Swakeleys, Uxbridge
Clive, Lieut. Col. the Hon. G. W. Windsor, M.P....53, Grosvenor Street
Clowes, Wm....51, Gloucester Terrace, Hyde Pk., W.
Clutterbuck, R....8, Great Cumberland Place, W.
Clutton, John...9, Whitehall Place, S.W.
†Clutton, John Henry...9, Whitehall Place, S.W.
Clutton, Robert George...9, Whitehall Place, S.W.
Cole, Sir H., K.C.B....South Kensington, S.W.
Colville H. K... 4, Ovington Gardens, Brompton, S.W.
Cope, John A. M....14, Pembridge Square, W.
Couchman, J. W....Pembury Road, Tottenham
Cowper, E. A., C.E....6, Gt. George St. Westminster
Craigie, P. G..Hartley Ho., Lower Heath, Hampstead
Crisp, Edwards, M.D....29, Beaufort Street, Chelsea
Crutchley, General...Sunninghill Park, Staines
Cuff, J. H....New Cattle Market, Islington, N.
†Cummins, E. R....Moat House, Enfield
Daniels, Philip J....3, Brabant Court, E.C.
Darkin, Frank...171, Queen Victoria Street, E.C.
Darkin, Walter...26, Catherine Street, Strand, W.C.
Daubeny, Robert..2, King's Bench Walk, Temple, E.C.
†Davis, R....9, St. Helen's Place, Bishopsgate, E.C.
Day, Thomas...22, Dorset Street, Baker Street, W.
De Pass, Daniel...9, Delamere St., Westbourne Sq.
†Derham, William...Hazlewood, Palmer's Green, N.
De Salis, Rev. Henry J....Portnall Park, Staines
Driver, Robert Collin...4, Whitehall, S.W.
†Druce, S. B. L....10, New Square, Lincoln's Inn, E.C.
Dudgeon, John...17, Kensington Gate, W.
†Dun, Finlay...2, Portland Place, W.
Dunlop, A. M....3, Old Palace Yard, S.W.
†Dunn, Thos...1, Prince's Gardens, S. Kensington, S.W.
Dyer, Bernard...17, Great Tower Street, E.C.
†Easton, James...37, Norfolk Square, W.
†Elliot, J. Lettsom...C4, Albany, Piccadilly, W.
Enfield, Viscount...7, Charles Street, Berkeley Sq., W.
Fair, John...50, Hamilton Terrace, St. John's Wood, N.W.
†Fairbairn, Sir A....15, Portman Square, W.
Farmer, James...6, Porchester Gate, Hyde Park, W.
†Fellowes, James...6, Bryanston Square, W.
†Field, Barclay...26, Hill Street, Berkeley Sq., W.
†Field, Henry...Conservative Club, S.W.
†Field, William...Kingsbury
†Fitzgerald, Major...8, South Eaton Place
†Fletcher, John Philip...Sunbury
Forbes, A. E. W....1, Albert Mansions, Victoria Street, S.W.
Fowler, Robert...71, Cornhill, E.C.
†Freebody, W. Yates...50, Bedford Row, W.C.
†Gibbs, Henry H..St. Dunstan's, Regent's Park, N.W.
Gibbs, Thomas...26, Down Street, Piccadilly, W.

Gibbs, Thomas B....56, Clissold Road, Stoke Newington, N.
Glasier, William R....41, Charing Cross, S.W.
Gollan, Donald...6, Porchester Gate, Hyde Park, W.
†Gooch, John V....105, Pall Mall, S.W.
Graham, Walter...West Drayton, Uxbridge
†Graham, William...The Lodge, Highbury, N.
†Grant, Colonel W. L....4, Southwick Crescent, W.
Grantham, R. B., C.E....22, Whitehall Place, S.W.
Greening, E. Owen...47, Millbank Street, S.W.
Greville, Lord...39, Lowndes Square, S.W.
†Grey, Charles G....55, Parliament Street, S.W.
†Grey, The Hon. Sir F. W. G., C.B..Lynwood, Staines
Griffin, Colonel...36, Worship Street, E.C.
†Grimwood, G....29, Ennismore Gardens, S.W.
†Grosvenor, Lord Richard, M.P...76, Brook Street, W.
†Hall, J. Orde..1, Brunswick Row, Queen's Sq., W.C.
†Hall, Captain Marshall...7, Savile Row, W.
Hall, Richard...37, Great George Street, S.W.
Harrison, J. T....Thornhill, Castlebar, Ealing
Harrison, T. J....1, Essex Villas, Kensington, W.
Hathorn, A....30, Charing Cross, S.W.
†Hay, C. A....127, Harley Street, N.W.
†Hayne, John...24, Gloucester Sq., Hyde Pk., N.W.
Hempleman, F. T....West Ham, E.
†Heseltine, E....6A, Austin Friars, E.C.
†Heywood, Jas..26, Palace Gardens, Kensington, W.
Hicks, Leonard H....Paddock Lodge, Kentish Town
†Hill, D. W....Pinner
Hill, Henry...52, Queen's Gate Terrace, S.W.
Hill, John...West Smithfield, E.C.
†Holman, Stephen...Spring Lodge, Ealing
Honywood, William...52, Warwick-square, S.W.
†Hood, Capt. Hon. A....8, Grosvenor Gardens, S.W.
Hope, W. A....Agricultural Hall, Islington, N.
Hunt, E. Bradley...Hayes, Uxbridge.
Hutton, Robert..74, Gloucester Pl., Portman Sq., W.
Jemmett, Capt. W. S...Club Chambers, Regent St., W.
Jessop, Joseph...Grove Farm, Chiswick
Johnson, A. H....Gunnersbury House, Isleworth
Johnson, A. H., jun....Hanger Hill Farm, Ealing
Johnson, C. W....36, Mark Lane, E.C.
Johnson, E. Lionel, jun....13, Crutched Friars, E.C.
Johnstone, E....3, King's Bench Walk, Temple, E.C.
†Jonas, Henry...4, Whitehall, S.W.
†Kelk, John W....Bentley Priory, Stanmore.
Key, Sir Kingsmill G., Bart....Holborn Viaduct, E.C.
King, William...Denham, Uxbridge
Kingsbury, E. W....George Yard, Lombard St., E.C.
†Knight, A. H....62, Holland Park, W.
Langworthy, J. L....National Club, Whitehall, S.W.
†Laurie, A....70, Jermyn Street, S.W.
†Lees, Charles...23, Philpot Lane, E.C.
Le Grand, A....100, Bunhill Row, E.C.
†Locock, Fred...Oxford and Cambridge Club, S.W.
†Longbourne, W. F....7, Lincoln's Inn Fields
Lott, John...156, Victoria Park Road, E.
†Lowther, Hon. W., M.P....Lowther Lodge, Kensington Gore, S.W.
Lucan, Earl of...36, South Street, Park Lane, W.
Macadam, C. T....109, Fenchurch Street, E.C.
McClure, J. H....115, Cannon Street, E.C.
McDougall, James T....10, Mark Lane, E.C.
Mackay, A. S. H....Powis Square, Kensington Park
Mackay, Hugh...155, Fenchurch Street, E.C.
†Malcolm, Major-General...67, Sloane Street, S.W.
†Malcolm, John...7, Great Stanhope Street, W.
Maple, John...Bedford Lodge, Hampstead, N.W.
†Marjoribanks, Sir Dudley C., Bart., M.P....Brook House, Park Lane, W.
†Marjoribanks, E., jun....59, Strand, W.C.
Markby, J. R....9, Whitehall Place, S.W.
Marshall, Rev. C....9, South St., Finsbury Sq., E.C.
†Martin, F. B. P...Oxford and Cambridge Club, S.W.
Maude, Col. G. A., C.B....Stud Farm, Hampton Court
May, A. M....5, Clifton Gardens, Maida Vale, W.
†Meyer, James...Forty Hall, Enfield
Milburn, R....76, Church Lane, Whitechapel, E.
Mockford, W. G. S....57½, Old Broad Street, E.C.
Moore, H. F....37, Waterford Road, Fulham, S.W.
Moore, James...11, Upper Berkeley Street, W.
Moore, J....Syon House, Brentford
†Morrison, F..8, Cromwell Houses, S. Kensington, W.
Morton, Francis....1, Delahay Street, S.W.
†Morton, J. D....19, Parliament Street, S.W.
Nelson, E. M....Hanger Hill House, Ealing
†Newson, Harry C....44, Bloomsbury Square, W.C.
†Nicholson, W....4, Sussex Square, Hyde Park, W.
†Nisbet, R. P...9, Stanley Crescent, Notting Hill, W.
†Oakley, Christopher...10, Waterloo Place, S.W.
Odams, James...109, Fenchurch Street, E.C.
Okes, John C. R....39, Queen Victoria Street, E.C.
Owens, Samuel...Whitefriars Street, E.C.
Palmer, A....8, Lancaster Place, Strand, W.C.
†Parkinson, John....9, Union Court, Old Bread Street, E.C.
Part, Chas. T....3, King's Bench Walk, Temple, E.C.
Perkins, Loftus...6, Seaford St., Regent Square, W.C.
Perkins, W. H....65, Sutherland Gardens, W.
†Peto, Sir Morton, Bart....9, Victoria Chambers, Victoria Street, S.W.
Phillips, H. R....Willesden Paddocks, Kilburn
Phillips, Maj.-Gen. Sir T..... Senior United Service Club, S.W.
Phillips, T. E....Heston, W.
†Phillpotts, Thomas, jun...Junior Carlton Club, S.W.
†Pickford, W....148½, Fenchurch Street, E.C.
Pilgrim, C. H....Merlwood, Virginia Water, Staines
Pole, Sir Van Notten P., Bt...59, Gloucester Pl., W.
Powis, Charles...60, Gracechurch Street, E.C.
Pritchard, William...Royal Veterinary Col., N.W.
Proctor, M. M....49, Thornhill Square, Barnsbury
Purser, Edward...116, Fenchurch Street, E.C.
Pye-Smith, A....St. Pancras Works, St. Pancras Road, N.W.
Randolph, Colonel...76, Chester Square, S.W.
Ridgley, Francis...Holly Hill Farm, Enfield
Ringrose, R. B....71, Elsham Road, Kensington, W.
Robinson, Sir J. S., Bart....20, Park Lane, W.
†Roebuck, Rt. Hon. J. A., M.P....19, Ashley Place, Victoria St., S.W.
Rotton, Richard...3, Boltons, Brompton, S.W.
†Rucker, Martin D....115, Leadenhall Street, E.C.
Sainsbury, E....Victoria Docks, E.
Sanders, J. W....Upton House, Teddington
†Sandford, G. M. W., M.P....33, Hertford St., May Fair, W.

†Schwann, F. S...2, Prince Arthur Road, Hampstead
Scott, Col. the Hon. C. G....79, Eaton Square, S.W.
Scott, Louis Guy...79, Eaton Square, S.W.
Scott, T. C...King's Arms Yard, Moorgate St., E.C.
Shackle, Thomas...Hayes, Uxbridge
Shanks, F....4, Great Queen Street, W.C.
†Sherborn, Francis...Bedfont, Hounslow
Short, A. L. H....45, Chapter St., Vauxhall Bridge Road, S.W.
Simpson, A...Chiswell Street, E.C.
†Simpson, Pinder...34, Savile Row, W.
Sladen, D. B.... 2, King's Arms Yard, E.C.
Sladen, St. Barbe...1, Delahay Street, S.W.
†Smith, Charles...7, Great Tower Street, E.C.
†Smith, Edward J....16, Whitehall Place, S.W.
Smith, Henry Hubert...6, Whitehall, S.W.
†Smith, J. Hesletine...10, Lower Phillimore Place, Kensington, W.
Smith, M. T....13, Upper Belgrave Street, S.W.
Smith, R. B....Huxley Farm, Edmonton
†Snell, J. F....Hendon
Soames, D. W....Harrow Weald, Stanmore
Spencer, John...Euston Road, King's Cross, N.
Squire, William...5, Coleman Street, E.C.
Stallard, J....4, Albemarle Street, W.
Stanhope, Earl...3, Grosvenor Place Houses, S.W.
†Stanley, E. J....14, Grosvenor Square, W.
Stevens, W. Carr...33, Mark Lane, E.C.
†Stirling, John...17, Ennismore Gardens, W.
Stocker, J. P....93, Oxford Terrace, W,
Strafford, Henry...13, Euston Square, N.W.
†Streeter, Edwin W....18, New Bond Street, W.
Sutcliff, Robert...100, Bunhill Row, E.C.
Talbot, Hon. Col. W. P....Oakington, Harrow
Tattersall, Edmund...Albert Gate, S.W.
Taylor, James...Farmers' Club, Inns of Court Hotel, W.C.
Taylor, J. Wells...Chester Terrace, Regent's Pk., W.
†Taylor, Richard...6, Gledhow Gardens, South Kensington
†Thornton, John...7, Princes Street, W.
Thynne, F. G....11, Great George Street, S.W.
Tillyer, Richard H....Heathrow, Hounslow
†Tisdall, A....Melbury Road, Kensington
Tisdall, E. C...Holland Park Farm, Kensington, S.
†Tollemache, H. B...Junior United Service Club, S.W.
†Tomline, Colonel G...1, Carlton House Terrace, S.W.
†Tooke, Rev. J. T. H....University Club, Suffolk Street, S.W.
Tucker, G. N....79, Mark Lane, E.C.
†Tuckett, P. D., jun....10A, Old Broad Street, E.C.
Tuson, R. V....Royal Veterinary College, N.W.
†Tyler, Sir James...Pine House, Holloway, N.W.
Unite, John...291, Edgware Road, W.
Valpy, Richard...5, Rutland Gate, S.W.
†Vavasour, Sir H. M., Bart....8, Upper Grosvenor Street, W.
†Veitch, H. J....Exotic Nurseries, Chelsea
Vivian, Lord...Brooks's Club, St. James's Street, S.W.
†Wade, Richard...13, Seymour Street, W.
Wainwright, C. J....251, High Holborn, W.C.
†Walker, John L...71, Oxford Terrace, Hyde Pk., W.
Wall, T. Senior...120, Maida Vale, W.
Warner, Robert...8, The Crescent, Cripplegate, E.C.
Weatherby, James...6, Burlington Street, W.
Webber, John...340, Camden Road, N.
†Webster, Charles...Cowley, Uxbridge
Welch, Alfred...Southall
Welford, J....Warwick Place, Paddington, W.
Wetherall, W. S....117, Cannon Street, E.C.
†Whitbread, S. C....49, St. George's Square, S.W.
White, Arnold W....12, Great Marlborough St., W.
†Whitehead, Jeffery...39, Throgmorton Street, E.C.
†Wicks, John...38, St. Luke's Road, W.
Wing, T. Twining...17, Woburn Square, W.C.
Withers, S. H....242, Oxford Street, W.
Wolverton, Lord...Stanmore Park
Wood, Walter A....36, Worship Street, E.C.
Woodger, J....39B, Goldhawk Road, Shepherd's Bush, W.
†Wren, Walter...2, Powis Square, W.
†Wrench, Robert...39, King William Street, E.C.
Wright, W. P....36, Phillimore Gardens, Kensington
†Wrightson, R.H...37, Great Cumberland Place, W.
†Wyndham, Hon. P., M.P....44, Belgrave Sq., S.W.

MONMOUTHSHIRE.

Governor.

Tredegar, Lord...Tredegar, Newport

Members.

†Bailey, Crawshay...Maindiff Court, Abergavenny
Baker, Daniel...Roggiett, Chepstow
†Berrington, Arthur D....Pant-y-Goitre, Newport
Brewer, Tom Llewelyn...Dany Graig, Newport
Bull, Edward...Crick, Chepstow
†Cartwright, William G., M.A....Newport
Cartwright, William S....Stow House, Newport
Chandler, Charles T....Haysgate, Chepstow
†Cooke, Thomas Eborall...Newport
Dix, C. C....Mamhilad, Pontypool
Dowle, Francis...Ifton, Chepstow
†Dudleston, W....New Lodge, Donnington, Newport
Evans, Sydney T....Fern Hill, Newport
†Evans, William...The Fields, Newport
Firbank, Joseph...Newport
Fothergill, W....Cefnrhychdir, New Tredegar
†Fox, Charles B....Malpas, Newport
†Fryer, Henry C....Lodge Park, Glandovey, Aberystwith
Graham, W., jun....Newport
Graham, W. Benjamin...Maindee, Newport
Harrhy, David...Newport
Herbert, Major Edmund...Llansantffraed, Abergavenny
Herbert, J. A....Llanarth Court, Raglan
Higgins, E. H....Machin Place, Newport
Holehouse, John...Rogerstone Grange, Chepstow
Homfray, Lorenzo A....Woodlands, Newport
Homfray, S....Glenuske Park, Caerleon, Newport
Hughes, Captain J. G. P....Allt Llwyd, Aberystwith
John, W., jun...Rogerstone Castle, Tydee, Newport

Lawrence, J....Crick House, Chepstow
†Lewis, Charles E....St. Pierre, Chepstow
Lister, Edward...Cefn Ila, Usk
†Mitchell, F. J., Llanfrechfa Grange, Caerleon, Newport
Morgan, Roger...Llanellan, Abergavenny
Parsons, Valentine...Slough, Chepstow
†Peacock, T. K....Ruperra Castle, Newport
Phillips, Charles...14, Clytha Square, Newport
Price, Henry...Undy, Newport
Price, J. E....The Rhadyr, Usk
Price, W....New House, Caerleon, Newport
Raglan, Lord...Cefutilla House, Usk
Rees, W. G....Hill House, Newport
Relph, G. R. Greenhow...Beech Hill, Usk
†Rolls, J. Allan...The Hendre, Monmouth
Stone, John S....Newport
†Stratton, R....The Duffryn, Newport
Tucker, Edwin...Frogmore Street, Abergavenny
†Tyler, Capt. G. G.....The Callow Hill, Monmouth
Wienholt, William...Llanwern, Newport
Williams, Rev. E. Turberville...Caldicot, Chepstow
Williams, Lewis...Redwick House, Chepstow
Woodall, Thomas...Dinham, Chepstow
†Woollett, R. F....Newport

NORFOLK.

Governors.

Wales, H.R.H. the Prince of, K.G....Sandringham
Buxton, Sir R. Jacob, Bt....Shadwell Court, Thetford
†Leicester, Earl of, K.G....Holkham Hall
Stafford, Lord...Cossey Hall, Norwich
Suffield, Lord...Gunton Park, Norwich

Members.

Adlington, H. S....Holm-Hale Hall, Shipdham
Aldous, James Arthur...Lingwood, Norwich
Aldous, John...Tivetshall, St. Mary, Scole
Allen, Rev. Dr...Shouldham Hall, Downham Market
Allen, Thomas...Marks Hall, Norwich
†Amhurst, W. A. T....Didlington Park, Brandon
†Angerstein, W....Weeting Hall, Brandon
Anthony, John...Fincham, Downham Market
Applegate, T. W....Tittleshall, Swaffham
†Applewhaite, E....Pickenham Hall, Swaffham
†Atkinson, C....Swanton Novers, East Dereham
†Aylmer, Hugh...West Dereham, Stoke Ferry
†Aylmer, John B....Fincham Hall, Downham
†Aylmer, Robert B....Westacre Abbey, Swaffham
†Back, J. A...The Old Hall, Hethersett, Wymondham
Bacon, James...Attleborough
Bagshaw, George...Norwich
Bailey, Walter J....East Lexham, Swaffham
Baker, Robert S....North Walsham
Baker, Wm. E....Tilney All Saints, King's Lynn
Baker, Wm. P....Phœnix Works, King's Lynn
Barcham, Thomas...The Limes, Paston, North Walsham
Barnard, Charles...Norwich
Barnes, Samuel...Serlingham, Norwich
Barwell, John...Hoveton Hall, Neatishead
Bate, William...Claxton, Norwich
Bately, S. S....Southtown Road, Great Yarmouth
Bayning, Lady...Honingham Hall, Norwich
Beart, Charles...Stow Bardolph, Downham
Beart, Walter John...King's Lynn
Beauchamp, G. P....Langley Park, Norwich
Beauchamp, Sir R. P., Bart...Langley Park, Norwich
Beck, Edmund...Sandringham, King's Lynn
Beck, F. W....Mileham, Swaffham
Bell, Francis...Heath Cottage, Norwich
Betts, Thomas...Winfarthing, Diss
Betts, W. H....Frenze Hall, Diss
Bidwell, Thomas S....Thetford
†Birch, Wyrley...Wretham Hall, Thetford
Bircham, William...The Hollands, Reepham
†Bircham, William G...Dunton, Fakenham
†Bird, Rev. J. Waller...Foulsham Rectory
Birkbeck, Edward, M.P....Horstead Hall, Norwich
†Birkbeck, Henry...Norwich
Bishop, John...The Walk, Market Place, Norwich
Blyth, D'Urban...Great Massingham, Rougham
†Blyth, James...Weasenham All Saints, Brandon
Bolton, John S....Oulton, Aylsham
†Bonner, Henry C....East Rudham, Rougham
Booth, Nathan, jun....North Delph, Downham
Boucher, C....Burgh Hall, Hevingham, Norwich
Bourchier, Major J....Feltborpe Hall, Norwich
Boulton, W. S....Rose Lane, Norwich
Bowler, W. A....Opie Street, Norwich
Boyce, John...The Grange, Old Catton, Norwich
Brackenbury, W. T...Shouldham Thorpe, Downham
†Branford, Womach...Godwick, Swaffham
Brereton, Rev. J. L....Little Massingham, Rougham
Brown, Benjamin...Wellingham
†Brown, Thomas...Marham, Downham Market
Brown, John W. M....Inmere Farm, Snettesham, Lynn
Brown, William...Haynford Hall, Norwich
Browne, R. C....Elsing, East Dereham
†Budd, Thomas W....Shropham Hall, Thetford
†Burrell, Charles...Thetford
Burrell, Charles, jun....The Shrublands, Thetford
Burton, John P. M....Taverham Rectory, Norwich
Butcher, William...Norwich
Butler, Thomas...Spixworth Park, Norwich
Buxton, Samuel Gurney...Catton Hall, Norwich
†Bygott, Robert...North Creake, Fakenham
Byles, Robert...Newton Flotman, Long Stratton
Canterbury, Viscount...Witchingham Hall, Norwich
Case, James...Cockthorpe, Wells
†Case, James P....Testerton, Fakenham
Case, William...Tuttington, Hevingham
†Cator, Albemarle...Woodbastwick Hall, Norwich
Chambers, Thomas, jun....Colkirk Hall, Fakenham
Childs, Henry...East Winch, King's Lynn
Christie, H. Christie...Framingham Manor House, Norwich
Clarke, William R....Wattlefield Hall, Wymondham
Clarke, W. R....Wymondham
Coker, James P....Bentley Hall, Dereham
†Coldham, H. J....Anmer Hall, King's Lynn
Colman, J. James, M.P....Carrow House, Norwich

Colman, Samuel...Willy Hall, Attleborough
Colman, T. H....Rockland St. Peter, Attleborough
Cook, Henry...Burnham Westgate, King's Lynn
Cooke, Frederick J....Caston Hall, Attleborough
Crawshay, Charles...Hingham, Attleborough
Cresswell, Mrs. Gerard...Appleton Hall, King's Lynn
Crickmore, William...Seething, Brooke
Cronshey, James...Thetford
Crowe, Daniel...Gaywood, King's Lynn
Crowe, Edmund...Denver, Downham Market
Cubitt, George...North Walsham
Cubitt, William...Bacton Abbey, North Walsham
Custance, Hambleton, F....Weston House, Norwich
Davey, John G. Ellis...Horningtoft, Elmham
Day, Gerard J....Horsford House, Norwich
†Dewing, R....Carbooke
Digby, Rev. K....Tittleshall Rectory, Litcham
Dodman, Alfred...King's Lynn
Durrant, G....Redenhall Grange, Harleston
Dutchman, Durrant...Swaffham, Brandon
†Eaton, George...Spixworth, Norwich
†Eddison, W....Windling, East Dereham
Edwards, George F....Marlingford, Norwich
Edwards, Henry N....Hardingham Hall, Attleborough
Edwards, Thomas H....Keswick, Norwich
†Ellis, John B., jun....West Barsham, Fakenham
England, Richard...Binham, Wells
†Everington, W. D....The Lodge, Castleacre, Swaffham
Everitt, Percival...Ryburgh, Fakenham
Everitt, Thomas...North Creake, Fakenham
Ewing, John Edward...Norwich
†Farrer, Edmund...Sporle, Swaffham
Farrow, Charles...Diss
Fellowes, Robert...Shotesham Park, Norwich
Fellowes, Rev. T. L....The Vicarage, Honingham
Fergusson, John...Brettenham Manor, Thetford
†Ffolkes, George B...Cougham Lodge, King's Lynn
Ffolkes, W. H. B....Hillington Hall, Lynn
Finch, Jacob...Swaffham
Fison, Cornell. ..Ford Place, Thetford
†Fison, Cornell Henry....Thetford
Fitzroy, Lieut.-Col. H....Stratton Strawless, Norwich
Foster, Sir William, Bart....Hardingham, Attleborough
Fowler, Ernest W....Gunton Old Hall, Lowestoft
†Frere, G. Edward...Roydon Hall, Diss
Fulcher, Thomas...Elmham Hall, Dereham
Gayford, E. J....Syderstone, Fakenham
Gayford, Thomas...Wretham Manor Farm, Thetford
Gilbert, C. T. C....Strumpshaw Hall, Norwich
Gilbert, Edward...Blofield
Gilbert, H. C. B....Bradeston Hall, Blofield
Gilbert, T. Denny...Cantley, Norwich
†Gilbert, William A....Cantley, Acle
Gostling, T. P....Diss
Gowing, George...Hellesdon, Norwich
Green, Edmund...King's Lynn
Griffin, Charles...Feltwell, Brandon
†Griggs, James...South Creake, Fakenham
†Gurdon, Brampton...Letton Hall, Shipdham
Gurdon, R. T....Eccles Hall, Attleborough
†Gurney, John H....North Repps, Norwich
Hammond, John...Bale, East Dereham
†Hamond, Anthony...Westacre, Brandon
†Hamond, Washington...Pensthorpe, Fakenham
Hansell, P. E....Thorpe, Norwich
Harbord, Hon. H....Gunton Park, Norwich
†Hardy, W. H. C....Letheringsett Hall, Holt
Hare, Sir T., Bart....Stow Hall, Downham Market
Harlock, Henry...Feltwell Grange, Brandon
Harrison, Edward...Sporle, Swaffham
†Harrison, Harris...West Lexham, Castleacre
Hastings, John...Longham Hall, East Dereham
Heath, William...Ludham Hall, Norwich
Helsham, Gustavus...St. Mary s Hall, King's Lynn
Hickling, J. S....Cawston, Norwich
Hoff, William G....Wormegay, King's Lynn
†Holmes, Gervas...Brockdish Hall, Scole
Holmes, G. T....Globe Lane, Norwich
Holmes, John...Globe Lane, Norwich
Holmes, Sancroft...Gawdy Hall, Harleston
Howes, James...Chapel Field, Norwich
†Hudson, T. Moore...Castleacre, Brandon
Ives, Robert...Calthorpe, Hanworth
Jillings, W. G....Bridgham, Thetford
†Jodrell, Sir E. R., Bart....Sall Park, King's Lynn
Jones, George...Stow, Downham Market
†Jones, Sir W., Bart....Cranmer Hall, Fakenham
Kemp, Sir Kenneth H., Bart....Gessing Hall, Diss
Kendle, Robert J....Weasenham, Brandon
Keppel, Rev. W. A. W....Leachen Hall, Swaffham
Kimber, Thomas...Burfield Hall, Wymondham
†Kimberley, Earl...Kimberley, Wymondham
†King, John L....Thorpe Abbots, Scole Inn
Knight, Fernley...Castle Rising, King's Lynn
Leeds, Charles Stephen...Tattersett, Fakenham
†Leeds, Robert...Keswick Old Hall, Norwich
Lee-Warner, H. J...Walsingham Abbey
†Le Strange, H....Hunstanton Hall, King's Lynn
Ling, Edmund, Hempstead Hall, Holt, East Dereham
†Lombe, Rev. H. E ...Melton Hall, Wymondham
†Long, Kellett...Dunston Hall, Norwich
Low, Frederick...Norwich
Lucas, George...Filby House, Norwich
Mack, T. Bacton...North Walsham
Mackenzie, Edward P....Downham Hall, Brandon
Magnay, Frederick Arthur...Drayton, Norwich
Mann, John...Thornage, Thetford
Mann, Thomas...Thelveton Hall, Scole
Marriott, J. Lewis...Narborough, Brandon
Marsham, C. R....Stratton Strawless Hall, Norwich
Marsters, Charles...Saddlebow, King's Lynn
†Mason, Claxton B....Beechamwell, Swaffham
†Matthews, T....Newton, Castleacre, Brandon
Micklethwait, G. N....Chapel Field Grove, Norwich
†Micklethwaite, F. N....Taverham Hall, Norwich
†Middleton, Charles...Holkham
†Middleton, E. P....Hindringham Hall, Walsingham
†Moore, T William...Warham, Wells
Mott, J., Stanley...Barningham, Hanworth
Murton, Thomas...Kenninghall, Thetford
Le Neve, Charles...Martham, Norwich
Newcome, Edward C....Feltwell Hall, Brandon
Newcome, Francis D'Arcy...Feltwell Hall, Brandon
Nicholson, G. M....Brisley, Swaffham

†Norris, William...Wood Norton, Dereham
North, Charles...The Hall, Rougham
Oldfield, Alfred...Grimston, King's Lynn
†Oldfield, Edmund...Fouldon Hall, Brandon
†Overman, Henry R....Weasenham, Fakenham
†Overman, John...Burnham Sutton
†Overman, Robert...Edgmere, Walsingham
†Page, Martin F....Blakeney, East Dereham
Palmer, J. F....Wilby, Attleborough
Palmer, Leonard J....Snetterton, Thetford
Parker, Hastings...Dudwick House, Buxton
Parmeter, Francis...Booton, Norwich
Patteson, Henry S....Cringleford, Norwich
Patteson, Henry T. S....Cringleford, Norwich
Peacocke, W. C....South Hilgay, Downham
Pearce, John Bond...Surrey Street, Norwich
Pechey, William...Thetford
Platten, Rev. J. C....North Barsham, Fakenham
Pontifex, Arthur...Bressingham Hall, Diss
Postle, John Seaman...Smabourgh, Norwich
Postle, William Seaman..Smabourgh Hall, Norwich
Powell, Charles...Wighton, R.S.O.
Preston, Sir J. H., Bart....Beeston Hall, Neatishead, Norwich
†Read, Clare S., M.P...Honingham Thorpe, Norwich
†Read, G., jun....Barton Hall, Brandon
Reeve, Sims...Norwich
Rinder, Joseph...Bowthorpe Hall, Norwich
†Ringer, T. F....Summerfield, Lynn
Rising, Robert...Horsey, Great Yarmouth
Rising, Robert C....Oxnead Hall, Norwich
Rising, Thomas...Rollesby, Great Yarmouth
Rix, G....Gayton Thorpe, King's Lynn
Rogers, John F....Swanington, Norwich
Rose, Thomas...Melton Magna, Wymondham
Santy, A. H....Castle Meadow, Norwich
Sapwell, Benjamin B....Aylsham
Savage, Frederick...King's Lynn
†Scott-Chad, Joseph S....Thursford Hall, East Dereham
Seago, Jeremiah...Stoke Holy Cross, Norwich
Seppings, T. J....Wormegay Grange, King's Lynn
Shacklady, W. B....Taverham, Norwich
Sharman, John W....Hempton Abbey, Fakenham
Sharman, Peter J....Scorning, East Dereham
Shellabear, Samuel...Holkham, Wells
Sheringham, H. V....South Creake, Fakenham
Sims, George...Wretham Hall, Thetford
Slator, John W....King's Lynn
Smith, George J....Ketteringham, Wymondham
Smith, Richard...Kimberley, Wymondham
Smith, William...Dickleburgh, Scole
Sparke, E. Bowyer...Gunthorpe Hall, East Dereham
Spurrell, Daniel...Bessingham, Norwich
Stedman, John B....East Rudham, Swaffham
Stoughton, Clarke...Bawdeswell, East Dereham
Stracey, Edward H. G....Thorpe, Norwich
†Stracey, Sir H. J., Bart., M.P....Rackheath Hall, Norwich
†Stroyan, Robert....Bixley, Norwich
†Stuart, J. Windsor...Raynham Hall, Brandon
Sudbury, James...Cantley, Norwich
Tallent, Herbert...Bylaugh, Dereham
Taylor, Alfred...Starston Place, Harleston
Taylor, F. O....Thruxton, Attleborough
Taylor, Francis...Diss
Taylor, Garrett...Easton, Norwich
Tayton, William...Syderstone, Fakenham
Thorn, Charles...St. Giles Gate, Norwich
†Thornton, Thomas...Wereham, Stoke Ferry
Thursby, Rev. W. F....Bergh Apton Rectory, Norwich
Tice, Richard...Barford, Wymondham
Tingay, George...Egmere, Walsingham
Tooke, B. Hales....Salhouse, Norwich
†Upcher, H. M....Feltwell, Brandon
Upcher, Henry R....Sherringham Hall, Cromer
Villebois, Henry...Marham, Downham Market
Waite, J. N....Bramerton, Norwich
†Walsingham, Lord...Merton Hall, Thetford
Waters, Horace M....Bittering, East Dereham
Watling, R. S....Scratby Hall, Great Yarmouth
Welcher, William...Griston Hall, Watton, Thetford
†Wellingham, John...East Walton, Lynn
Whisler, Henry....Great Massingham, Rougham
Wigg, Grigson H....Swanton Morley, East Dereham
Winearls, Henry...Westacre, Brandon
Winearls, Robert C....Marham, Downham Market
Winter, Ambrose, jun....11, The Crescent, Norwich
Woods, Henry....Merton, Thetford
Wortley, Robert...Suffield, Aylsham
Wotherspoon, J....Hethel Wood, Wymondham
Wright, Robert J....Queen Street, Norwich
†Wright, Thomas...North Runcton, Lynn
†Wright, W. J....Fring, King's Lynn
†Youngman, J. W....Westacre, Brandon

NORTHAMPTONSHIRE.

Governors.

Loder, Robert...Whittlebury, Towcester
Spencer, Earl, K.G....Althorpe Park, Northampton
Wells, William...Holmwood, Peterborough

Members.

Ball, William...Rothwell, Kettering
Barford, V....6, Watkin Street, Northampton
Barford, William...Peterborough
Bayes, Charles...Kettering
†Beasley, J. Noble...Chapel Brampton, Northampton
Beecroft, John...Eye, Peterborough
†Bennett, B. E....Marston Trussell (Theddingworth)
Berridge, Samuel...Croughton, Brackley
Bird, John, jun....Farset, Peterborough
Boyer, William...Cottesbrook, Northampton
Branson, William C....Little Weldon, Wansford
†Burdett, E....Islip, Thrapstone
†Burghersh, Lord...Apethorpe Hall, Wansford
Campbell, A....Thrapstone
Cantley, Rev. J....Thorney, Peterborough
Cartwright, T. L. M....Newbottle, Brackley
†Carysfort, Earl of...Elton, Peterborough
Cheney, W. J....Gidding Grove, Oundle
Clarke, John G....Brackley

†Cooch, Henry...Harleston, Northampton
Core, John...Peterborough
†Cowley, W. P....Braybrooke Lodge, Market Harborough
Crawley, J. R....Stanwick Lodge, Higham Ferrers
Dalton, Rev. R....Kelmarsh, Northampton
Davison, John Perry...Easton Maudit, Northampton
Eden, F. Morton...Boughton House, Kettering
†Edwards, C. Bidwell...Minster Close, Peterborough
Edwards, T. F....Tanholt Farm, Eye, Peterborough
†Elkins, J. F....Guilsborough, Northampton
Elliott, J. M. K....Greens Norton Hall, Towcester
Faulkner, William...Rothersthorpe, Northampton
†Fitzwilliam, Hon. C. W., M.P..Alwalton, Peterboro'
Fry, C. E. Bruce...East Haddon, Northampton
Garratt, R. Lancefield...Thorpe Malsor, Kettering
Goodman, James F....Staverton, Daventry
†Gordon, Lord Esmé S....Castor House, Peterborough
Gordon, Francis...Thornhaugh, Wansford
Griffin, C. W....Werrington, Peterborough
Griffin, Robert H....Boro' Fen, Peterborough
Harrison, Rev. J. H....Bugbrook Rectory, Weedon
Harrison, William H....Oxenden, Market Harboro'
†Hawkes, William...Thenford (Banbury)
†Hewitt, Robert H....Dodford, Weedon
Horrell, Harry...Thorney Abbey, Peterborough
Huntly, Marquis of...Orton Hall, Peterborough
Isham, Sir C. E., Bart....Lamport Hall, Northampton
Isham, Rev. Robt....Lamport Rectory, Northampton
Jelley, Henry...Yarwell Mills, Wansford
Jeyes, Francis C....Brixworth
†King, George.. East Haddon, Northampton
†Langham, H. H....Cottesbrook Park, Northampton
†Lenton, William, jun....Oundle
Little, George...Farcet, Peterborough
Little, Henry...Boroughbury House, Peterborough
Lovell, John M....Harpole, Weedon
†Lynes, G. Boulton...Eastcote, Towester
Lyveden, Lord...Laundemer, Oundle
Mackinder, Joseph...Peterborough
†Mason, Frederick...Wansford, Peterborough
Mawer, E....Wyrdelands, Thorney, Peterborough
Maxwell, W. G....Orton Longueville, Peterborough
†Monckton, E. H. C....Fineshade Abbey
Montgomery, Rev. R....Holcott Rectory, Northampton
Moore, J. W....Yaxley Lodge, Peterborough
Moore, W. G....Eye, Peterborough
†Nethercote, H. O...Moulton Grange, Northampton
Oldfield, Charles...Haddon, Peterborough
Oldham, T. E....Loddington Hall, Kettering
†Oliver, John...Oxenden, Northampton
Oliver, Robert E....Sholbrooke Lodge, Towcester
Orlebar, Richard...Hinwick, Wellingborough
†Osborn, George...Pattishall, Towcester
Page, Mark...Newbold Grounds, Daventry
†Peach, Edward...Oundle.
†Pell, A., M.P....Hazlebeach, Northampton
Pell, Robert...Orlingbury, Wellingborough
Pentelow, John...Rounds, Thrapston
†Perceval, Charles...West Haddon
Perkins, W....Singlesole, Thorney, Peterborough
†Phipps, P., M.P.... Collingtree Grange, Northampton
Potterton, W. H....Boughton Grange, Northampton
Rooke, John...Weldon Grange, Wansford
Roughton, James J....Kettering
Rowell, William.. Peterborough
Rush, Joseph A....East Haddon, Northampton
†Scriven, Charles H....Castle Ashby, Northampton
Scriven, George...Harpole, Weedon
†Scriven, G...Castle Ashby, Northampton
†Scriven, Richard George...Castle Ashby, Northampton
Sharp, Francis B....Finedon, Wellingborough
Simpkin, B....Fotheringay, Oundle
Singleton, E....Preston Deanery, Northampton
Slater, John...Orton Longueville, Peterborough
Smith, William...Kettering
†Stratton, J. Locke....Turveston House, Brackley
†Strong, C. Isham...Thorpe Hall, Peterborough
Thornhill, W. C. Clarke...Rushton Hall, Kettering
†Tibbits, Captain...Barton Seagrave, Kettering
Topham, Joseph...Thorney Park, Peterborough
†Tryon, Thomas...Bulwick, Wansford
Turner, George, jun....Thorpelands, Northampton
†Walker, Joseph...Newnham Grounds, Daventry
Walker, W....Duston, Northampton
Waring, John...Braunston, Daventry
†Wartnaby, John R....Clipston, Northampton
Warwick, R. D....Stanground, Peterborough
Waters, Richard...Charwelton House, Daventry
Watkin, John...Dallington, Northampton
†Westmoreland, Earl of...Apthorpe, Wandsford
Whitehead, William...Wollaston, Wellingborough
Whitton, J. W....Potcote, Towcester
†Whitworth, J. R....Mears Ashby, Northampton
Wilkinson, J. Rennie...Great Addington, Thrapston
Willows, J. G....Rushton, Kettering
Willson, Thomas...Knaptoft House, Oundle
Wilson, John...2, Albion Place, Northampton
†Wood, Rowland...Clapton, Thrapston
Wood, T. Roe...Northampton
Worthington, J...Whalley Range, Peterborough
Youmans, Richard...Badby, Daventry
Young, A. A....Orlingbury House, Wellingborough

NORTHUMBERLAND.

Governors.

†Browne, Alex. Henry...Callaby Castle, Alnwick
†Grey, Earl...Hawick House, Alnwick

Members.

†Anderson, Robert...Grey Street, Newcastle
Angus, George...Beech Grove, Newcastle
†Angus, John...Beacl, Stocksfield
Angus, Jonathan...Broomley, Stocksfield
†Annandale, W. M....Liutzford, Newcastle
Arkle, Thomas...Highlaws, Morpeth
Armstrong, John A....Bay's Leap, Wylam
Armstrong, T. J....5, Hawthorn Terrace, Newcastle

†Atkinson, J. H. H....Angerton, Morpeth
Aynsley, R. J....Gosforth, Newcastle
Balleny, C. D. W....Red Barns, Newcastle
Bell, Captain H....Wolsington, Newcastle
Bell, Robert...Newcastle
Bell, William...Cramlington
Benn, Thos. G....High House, Matfen
†Benson, William...Allerwash House, Hexham
Blackett, Sir E., Bart....Matfen, Newcastle
Blandford, Thomas...Corbridge
†Bolam, Robert G....Berwick-on-Tweed
Bolam, W. T....Westgate Road, Newcastle
Bosanquet, Rev. R. W....Roch, Alnwick
Brown, Rev. L. D....Unthank Hall, Haltwhistle
Burdon, George....Heddon House, Newcastle
Charlton, W. H....Hesleyside, Bellingham
†Chrisp, John...Rugley, Alnwick
Chrisp, L. C....Hawkhill, Alnwick
Clark, R....Lintz Green House, Newcastle
Clayton, John...Newcastle
†Clutterbuck, T....Warkworth, Acklington
Cockburn, G....8, Summerhill Grove, Newcastle
Cockburn, W. C....8, Summerhill Grove, Newcastle
Cresswell, A. J. Baker...Cresswell, Morpeth
†Crossly, Clement...East Learmouth, Cornhill
Culley, George...Fowberry Tower, Belford
†Cuthbert, William...Beaufront, Hexham
Davidson, J....Bank House, Acklington
Davison, John, jun....Frittington, Morpeth
†Dees, R. Richardson...Wallsend Hall, Newcastle
Dickinson, G. T....Wheelbirks, Stocksfield
†Dixon, John Thomas...Walwick Grange, Hexham
Dods, T. P....Erlains Gate, Hexham
Donkin, Robert...Rothbury, Morpeth
Dryden, Thomas...Moss Kennels, Haydon Bridge
Edwards, J....Woodhorn Grange, Morpeth
Embleton, Robert...Backworth, Newcastle
Farley, S. L....Close, Newcastle
Fawcus, John...South Charlton, Chathill
Fenwick, G. A....Newcastle
Finney, J. A....13, Postern, Newcastle
Friar, J. E....Grendon Bridge, Norham-on-Tweed
†Gibson, J....Guns Green Hill, Ayton, Berwick
Goddard, H. R....Belsay, Newcastle
Gray, E. J....Clifton, Morpeth
Gray, M. R....Horton Grange, Newcastle
Gray, Thomas...Clayton Street West, Newcastle
†Grey, Rt. Hon. Sir G. Bt....Fallowdon, Alnwick
†Harle, John Joseph...Mill Hills, Haydon Bridge
Harrett, Robert...Kirkwhelpington, Newcastle
Hay, Charles E....Bradford House, Belford
Hedley, Thomas...New Road, Newcastle
Henderson, John...Cornhill
Henderson, William...Fowberry Mains, Belford
Hodgson, Richard...Crofton Mills, Blyth
Hogg, James...Buckton, Belford
Hudspith, William...Greencroft, Haltwhistle
Huggup, James...Spindlestone, Belford
James, Thomas...Otterburn Castle, Newcastle
Jobson, William...Newton Barns, Chat Hill
Joicey, Edward...Newcastle
Joicey, John...Newton Hall, Stocksfield
Joicey, J. G....Newcastle
Kirsopp, Rev. F....Burn Brae House, Hexham
Kirsopp, James...The Spital, Hexham
†Laing, George...Wark, Cornhill
Langdale, Sampson...Espley House, Morpeth
Laws, C. J....Barrasford, Wall
Lawson, E....Redesdale Cottage, Newcastle
Lawson, Rev. E....Longhurst Hall, Morpeth
Laycock, Joseph...Low Gosforth, Newcastle
Lee, J. Bunting...Stocksfield Hall
Lee, Joseph...Dilston, Corbridge
Lennox, William...Six Mile Bridge, Newcastle
Logan, John W....Tweedmouth, Berwick
Loraine, Edward...The Riding, Riding Mill Station
Matthews, John, M.D....Tynemouth
Moult, John...40, Mosley Street, Newcastle
Muirhead, George...Paxton, Berwick-on-Tweed
†Nicholson, James...Murton, Berwick-on-Tweed
†Northumberland, Duke of...Alnwick Castle
Ord, Rev. J. A. Blackett...Whitfield Hall, Haydon Bridge
Ormston, Robert...Newcastle
Palmer, C. Mark, M.P....Newcastle-on-Tyne
†Paulin, J. S. L....Quay Walls, Berwick-on-Tweed
Potts, James...Seaton Burn, Dudley
Ramsay, G. H....Derwent Villa, Newcastle
Rea, Charles...Doddington, Wooler
Rea, George...Middleton House, Alnwick
†Richardson, C. T....Monkton Lodge, Jarrow-on-Tyne
†Richardson, E....Gosforth, Newcastle
†Riddell, H. B....Rothbury, Morpeth
Riddell, John...St. Ninians, Wooler
†Riddell, Sir W. B., Bart...Hepple, Rothbury, Morpeth
Ridley, John M....Walwick Hall, Humshaugh
†Ridley, Sir M. White, Bart., M.P....Blagdon, Cramlington
Ridley, Thomas...Parkend, Wark
†Robson, John...Bymess, Rochester
†Snowball, F. J....Seaton Burn House, Cramlington
Spencer, John...Whorlton Hall, Newcastle
†Spencer, J. Watson...Whorlton Hall, Newcastle
†Spencer, Michael...Lemington Hall, Blaydon
†Spencer, Thomas...Ryton, Newcastle
Spraggon, Benjamin...Nafferton, Stocksfield
†Stephenson, Clement...Newcastle
Stephenson, Hugh...Dene House, Newcastle
Straker, Henry...Dipton House, Riding Mill
Straker, J. C....Stagshaw House, Corbridge
†Surtees, Villiers C. V....Newcastle
Swan, W. Robert...Wallsend, Newcastle
Swann, John...Bedlington, Morpeth
†Swinburne, Sir John, Bt....Capheaton, Newcastle
Symm, J....Newton, Stocksfield
Tankerville, Earl of...Chillingham Castle, Alnwick
†Tate, John...Barnhill, Acklington
†Thew, Edward...Lesbury House, Alnwick
†Thompson, Alexander...Kirknewton, Wooler
Thompson, T. E....Lewin Shields, Haydon Bridge
Tindal, Adam...7, Argyle Terrace, Newcastle
Trevelyan, Sir W. C., Bart....Wallington, Newcastle
Turnbull, David...Lucker Hall, Belford
Turnbull, George...Tughall House, Chathill

†Waddilove, G. M. D....Brunton House, Hexham
†Wallis, Owen...Bradley Hall, Blaydon
Wallis, Robert...Stocksfield
Wanlace, L....Seaton Burn House, Dudley
Wigham, George...Laverick Hall, Cramlington
Wilson, Jacob...Woodhorn Manor, Morpeth
†Wilson, Thomas...Shotley Hall, Newcastle
Woods, J. A....Benton Hall, Newcastle
†Wright, T. Irwin...Charlton, Bellingham
Younger, John...Burradon, Newcastle

NOTTINGHAMSHIRE.

Governors.

†Manvers, Earl...Thoresby Park, Ollerton, Newark
Milward, Richard...Thurgarton Priory, Southwell
†Sutton, John Manners...Kelham, Newark

Members.

†Abbott, Thomas...Newark-on-Trent
Adams, James...The Fallowes, Oxton, Southwell
Allcock, Thomas...Radcliffe-on-Trent
Arnall, W. S....Sutton, Elton
†Baily, John...Python Hill, Mansfield
Baker, Robert...Gamston, East Retford
†Barker, E....South Muskham Grange, Newark
Bausor, John...Carrington, Nottingham
†Bayley, T. Harvey D....Edwinstowe, Ollerton
†Beaumont, G., jun....Bridgford Hill, Nottingham
Beevor, Henry...Blyth, Worksop
Bingley, Charles...Langold Farm, Worksop
Bousfield, Edward...Newark
Brett, John...Oxton Grange, Southwell
Brodhurst, Lucas...Upton, Southwell
Brown, Trevor Wade...Oakham, Mansfield
Bullen, E. J....Norwood Farm, Southwell
Burgass, William Henry...Nottingham
Burnell, E. P....Winkburne Hall, Southwell
Burrows, Thomas...Epperstone, Nottingham
Camm, Thomas...Ossington, Newark
Cane, Rev. T. C....Brackenhurst, Southwell
Carding, F....Combs Farm, Farnsfield, Southwell
†Cartwright, T. W...Ragnall Hall, Newton, Newark
Chamberlin, J. K. B...West Field, Tuxford, Newark
Chambers, John E. F....Norwood Park, Southwell
Cookson, W. J....Worksop Manor, Worksop
†Cranfield, W. N....Morton Grange, Retford
†Day, Charles...Easton (Stamford)
†Day, Nevile...Easton (Stamford)
Dyson, William...Goldthorpe, Worksop
†Edge, James Thomas...Strelley Hall, Nottingham
Esam, William...Upton, Southwell
Farrer, M. G....Epperstone, Nottingham
Faulconbridge, W. F....Bestwood Park, Bulwell
Faulks, Michael...Colston Basset, Bingham
Field, Samuel...Farnsfield, Southwell
Flower, Henry V....Scarrington, Whatton
†Foljambe, Francis J. S., M.P ...Osberton House, Worksop
†Francklin, J. L....Gonalstone Hall, Nottingham
†Galway, Viscount, M.P....Serlby Hall, Bawtry
Gelsthorpe, Thomas...Morton Manor, Newark
Gibson, Arthur S....Bulwell Hall, Nottingham
Gilbert, Henry...Barnby Manor, Newark
Godber, Samuel...Balderton, Newark
Golsthorpe, William...Annesley Woodhouse, Mansfield
†Greenfield, George...Belle Eau Park, Ollerton
Grundy, George...Tortworth, Bawtry
Hall, Francis...Park Hall, Mansfield
†Hall, Marriott...Thorpe Salvin, Worksop
†Hammersley, W....Parkinson Street, Nottingham
Harrison, Frank...Bilborough
†Hassall, G....Shelford Manor, Radcliffe-on-Trent
†Hemsley, John...Shelton, Newark
Heslop, Rev. Gordon...Cossall, Nottingham
†Hildyard, T. B. T., M.P....Flintham, Newark
†Hodgkinson, Frank...Kirkby-in-Hardwick, Sutton-in-Ashfield
†Hodgkinson, G....Kirkby-in-Ashfield, Nottingham
Hodgkinson, Grosvenor...Newark
Hole, James...Farndon, Newark
Hopkinson, Charles...Retford
Hopkinson, Henry...Stoke Field, Newark
†Horncastle, Henry...Edwinstowe, Ollerton
†Huntsman, Benjamin...West Retford
†Huskinson, Thomas...Epperstone, Southwell
Hutchinson, W....Felley Mill Farm, Annesley
Jalland, J. Foster...Widmerpool, Nottingham
†Johnson, George...Blaco Hill, Retford
Kelham, Robert...Bleasby Hall, Southwell
Kenrick, George...Thurgarton Hill, Southwell
Knight, W. E....14, Carter Gate, Newark
†Knowles, R. M....Colston Bassett, Bingham
Lamin, John...Bestwood Park, Nottingham
Listeo, Frederick...Upper Morton Grange, Babworth, Retford
†Lister-Kaye, C. W....Osberton, Worksop
Lowe, Robert N....Bassingfield, Nottingham
†Machin, J. Vessey...Gateford Hall, Worksop
Machin, Samuel C....Forest Farm, Papplewick, Nottingham
McLeod, J. M....William Street, Newark
March, John J....Scarrington, Whatton
Martin, H. B....Colston Bassett, Bingham
Marriott, W. T....Bleasby, Southwell
†Millington, D. J....Kirklington, Southwell
Moore, John...Calverton
Mortimer, James...Oxton, Southwell
†Munk, Harry...Holmepierrepont
†Musters, John C....Annesley Park, Linby
†Nall, Joseph...Papplewick, Nottingham
Naylor, G. B....Scaftworth, Bawtry
Neale, Charles...Newfield, Screveton, Bingham
Neale, Charles J....Mansfield
†Nevile, Rev. C....Thorney, Newark
†Nevile, George...Shebton, Newark
New, David...Waverley House, Nottingham
Nicholsen, W. N....Newark-on-Trent
Norman, Robert...Manor Farm, Rufford, Ollerton
Nuttall, John...Beestwood Park, Arnold
†Paget, Joseph...Stuffyn Wood Hall, Mansfield

Painter, John...Forest Road, Nottingham
†Park, Fergus W....Grove, Retford
Parke, William...Stragglethorpe, Newark
Parkin, John...Worksop
Parkin, William...Babworth, Retford
†Parkinson, L. Milward...Epperstone, Nottingham
†Parr, John...Cropwell Butler, Bingham
Paulson, F. W....Broomhill Grange, Ollerton
Peel, Thomas P....Sansome Wood, Oxton, Southwell
†Pierrepoint, Hon. E. H....Thoresby Park, Newark
Pinder, G. F....Great Morton, Retford
Potter, H...Bestwood Park, Arnold
Potter, Samuel...Ilkeston Park, Nottingham
Pyatt, Abraham...Wilford, Nottingham
Quibell, W. Oliver...Newark-on-Trent
Redgate, William...Scarthing Moor, Newark
Reek, Edward...Nuttall, Nottingham
Reynolds, H....Marlock House, Lowdham
Roadley, Gravenor S....Partridge Hall, Bawtry
†Sanday, William...Radcliffe-on-Trent
Sherbrooke, Henry P....Oxton, Southwell
Simpson, John T....Boughton, Ollerton
†Smith, Butler...Cropwell Butler, Bingham
†Smith, Edwards...Radcliffe-on-Trent
†Smith, Henry...Cropwell Butler, Bingham
†Smith, Henry, jun....Cropwell Butler, Bingham
Smith, Henry A....Wilford, Nottingham
†Smith, Percy L....Kimberley, Nottingham
Stafford, Thomas...Marnham, Newark
Stenton, Henry C....Southwell
Stephenson, William...Scaftworth, Bawtry
Storer, Chas., M.D....Lowdham Grange, Nottingham
Story, Henry V....Ruddington Manor
Taylor, J. Bagshaw...Radcliffe-on-Trent
Thomas, S. V....Stragglethorpe Hall, Newark
Tinley, Edward...Southwell
Truswell, John R....Farnsfield, Southwell
Turner, F. J....Mansfield Woodhouse, Mansfield
†Vere, John...Carlton-upon-Trent, Newark
Vernon, Granville H....Grove Hall, East Retford
Walker, John Deverell...Nottingham
Watson, Robert...Retreat House, Whatton
Webb, W. F....Newstead Abbey, Mansfield
Welch, Bryan S....Blyth, Worksop
White, Samuel...South Leverton, Retford
†Wigram, John...South Collingham, Newark
†Williams, Ashley G....Sparken, Worksop
Woods, Henry W.... Clipstone Park, Mansfield
Woolley, T. Smith...South Collingham, Newark
†Wright, H. Banks...Sheldon Hall, Newark
Wright, William...Fiskerton, Newark
†Wright, William...Wollaton, Nottingham
Young, Edward...Coddington, Newark

OXFORDSHIRE.

Governors.

Camoys, Lord...Stonor Park, Henley-on-Thames
Marlborough, Duke of, K.G....Blenheim Park

Members.

Allnutt, T. Alexander..Watlington Farm, Tetsworth
Ashhurst, John H....Waterstock, Oxford
Bacchus, William E....Horley, Banbury
Baker, Rev. R. L....Ramsden, Enstone
Barford, John Phillips...Banbury
Barnett, Henry...Glympton Park, Woodstock
†Bateman, Henry...Asthall, Witney
Beaumont, Joseph...Ducklington Hall, Witney
Berridge, Thomas...Middle Aston, Steeple Aston
Blake, Alfred...Sutton, Stanton Harcourt, Witney
†Blathwayt, G. W....Dyrham Park, Chipping Sodbury
Brassey, Albert...Heythrop Park, Chipping Norton
Brickwell, C. J....Overthorpe Lodge, Banbury
†Brown, A. H. C....Kingston House, Tetsworth
Browne, Rev. T. C....42, St. Giles's, Oxford
Browning, James T....Oxford
Bryan, John...Southleigh, Witney
†Bulford, James...Hordley Farm, Woodstock
†Caless, William...Bodicote House, Banbury
Calvertt, John S....Fairspear House, Witney
Cannon, Joseph C....Beckley, Oxford
†Cartwright, Colonel H....Egdon Hall, Banbury
Cartwright, Richard Aubrey...Edgcott, Banbury
Castle, George...Sutton, Stanton Harcourt, Eynsham
Castle, George R....Bicester
Chamberlin, William...Adderbury, Banbury
†Chillingworth, John...Horsepath, Oxford
†Churchill, Lord.. Cornbury Park, Enstone
Clarke, E. C....Haddenham, Thame
†Clarke, G. R....Chesterton Lodge, Bicester
†Cole, William Douglas...Bicester
Cooper, Henry Reeve...Crowmarsh, Wallingford
Craddock, R....Lyneham, Chipping Norton
†Dashwood, Major...Kirtlington, Oxford
Dashwood, Sir Henry W., Bart....Kirtlington Park, Oxford
Davids, Charles H....Bodicote Lawn, Banbury
†Davis, R. S. B....Swerford Park, Enstone
†Dickers, Samuel S....Golder Manor, Tetsworth
Dodwell, J....Manor House, Long Crendon, Thame
Dormer, C. Cottrill...Ronsham, Oxford
†Druce, Joseph...Eynsham
Dutton, John...The Limes, Witney
Effingham, Earl of...Tusmore House, Bicester
†Franklin, Joseph. .Scotsgrove House, Thame
Freeman, Edwin...Chilton, Thame
Garne, George...Churchill Heath, Chipping Norton
†Gaskell, Henry L....Kiddington Hall, Woodstock
†Gayner, C., M.A....1, New College Lane, Oxford
Gerring, R....Blenheim Park, Woodstock
Gillett, John...Oaklands, Charlbury
Gillett, John...Tangley, Chipping Norton
Glen, George...Stratton Audley Park, Bicester
†Godwin, John J....Troy Farm, Somerton, Deddington
Greaves, John...Elsfield, Oxford
Griffin, J. Whitehouse...Towersey Manor, Thame
Gutteridge, Charles...Assendon, Henley-on-Thames
†Hall, A. W., M. P....Barton, Steeple Aston
Hall, Richard ..Queen's Ford, Dorchester (Wallingford

†Harcourt, E. W....Nuneham Park, Oxford
Hawkins, Robert S....Broad Street, Oxford
Henley, Joseph J....Shotover Lodge, Oxford
†Henley, Rt. Hon. J. W....Waterpury, Wheatley
†Hibbert, P. E. T....Aynho Park, Banbury
†Holbech, Rev. C. W....Farnborough, Banbury
Hopkins, Rev. T. H. T....Magdalen College, Oxford
Howland, A. R....Ludesden House, Thame
Hughes, James...Wood Lawn, Oxford
†Jacobs, Robert...Bury Barns, Burford
†Jersey, Earl of...Middleton Park, Bicester
†Keene, Rev. C. Ruck..Swincombe House, Nettlebed
King, W. Padbury...Lower Heyford, Banbury
Knollys, Gen. Sir W., K.C.B...Blount's Court, Henley
Langham, Maurice...Shipton-on-Cherwell, Oxford
†Macclesfield, Earl of...Sherburn Castle, Tetsworth
†Mackenzie, E....Fawley Court, Henley-on-Thames
Mackenzie, W. D....Gillotts, Henley-on-Thames
Marriott, Captain E. J....Burford
Marsham, R., D.C.L....Merton College, Oxford
†Mason, James...Eynsham Hall, Witney
†Mather, D....Lower Court, Chadlington, Enstone
Matthews, Alfred T....Church Hanborough, Eynsham
Mewburn, W....Wykham Park, Banbury
†Middleton, Henry...Cutteslow, Oxford
Miller, Lieut.-Colonel...Shotover, Wheatley
Millington, Mrs....Ashgrove, Ardley, Bicester
†Morrell, F. J....St. Giles's, Oxford
Morrell, G. Herbert...Headington Hill Hall, Oxford
Mumford, J. A....Chilton Park Farm, Thame
Nevell, Edward...Beaconsfield, Great Tew, Enstone
†Newton, R. J....Campsfield, Woodstock
†Newton, William...Gould's Grove, Benson
†Norreys, Viscount...Wytham Park, Oxford
North, Lieut.-Colonel, M.P..Wroxton Abbey, Banbury
Parker, James S....Iffley, Oxford
†Parsons, Herbert...Elsfield, Oxford
†Parsons, John...Iffley, Oxford
Parsons, W....Hill Farm, Elsfield, Oxford
†Paxton, Edmund...Willaston House, Bicester
Perry, P. J....The Nurseries, Banbury
†Perry, T. A...Betham House, Avon Dasset, Banbury
Pickering, Leonard...Wilcote, Charlbury
†Piercy, Alfred...Cold Harbour, Henley
Pinnell, Charles...Westwell, Burford
Porter, T. West...Holwell Manor Farm, Burford
Porter, William...Kencott (Lechlade)
Reade, J....Shipton, Chipping Norton
Reynardson, H. B....Adwell, Tetsworth
Robbins, Harry...Northfield Farm, Witney
Roberts, Harry...Caswell, Witney
Rowland, John...Holly Bank, Wootton, Woodstock
Samman, William...Rosslyn House, Oxford
Samuelson, Bernhard, M.P....Banbury
Savidge, Matthew...Sarsden, Chipping Norton
†Sheldon, Jonathan...Eynsham
Sheldon, Thomas...Osney Mill, Oxford
†Shillingford, George W....Eynsham
Smith, Charles R....Swerford Park, Enstone
Smith, Samuel...Somerton, Deddington
†Staples-Browne, F. J....Brashfield House, Bicester
Stilgoe, Nathaniel...Adderbury, Banbury
†Stilgoe, Z. W....Adderbury Grounds, Banbury
Tawney, A. R....Banbury
Taylor, Thomas...Ashton Rowant, Tetsworth
†Thompson, Herbert E....Wroxton, Banbury
†Thomson, John...Baldon House, Oxford
Tredwell, William...Elsfield, Oxford
Vanderstegen, W. H....Cane End House, Henley
Ward, William...41, St. Giles's, Oxford
Watson, John...Shirburn Castle, Tetsworth
†Weaving, John W....Oxford
Wiggins, Walter John...Watlington
Wiggins, Wm..Watcombe Manor Farm, Watlington
Wilkinson, William...Oxford
Witherington, T. E....Holton Cottage, Oxford
†Worley, William...Field House, Witney

RUTLAND.

Governor.

Gainsborough, Earl of...Exton Hall, Oakham

Members.

†Barnes, Wilson...Teigh, Oakham
†Cunard, Gordon...Habbaton Hall, Uppingham
†Duncan, Alexander...Knossington Grange, Oakham
Eaton, C. O....Tolethorpe (Stamford)
Finch, George H., M.P....Burley-on-the-Hill, Oakham
Foster, Samuel...Uppingham
Freer, Benjamin...Uppingham
Painter, Benjamin...Burley-on-the-Hill, Oakham
Pinder, Robert...Whitwell, Oakham
Richards, Westley...Ashwell, Oakham
Tower, B. R. C....Hallaton Hall, Uppingham
†Tryon, Richard...The Lodge, Oakham
Ward, Robert...Harringworth, Uppingham
†Wing, William...Market Overton, Oakham
†Wortley, N. W....Ridlington, Uppingham

SHROPSHIRE.

Governors.

Bradford, Earl of...Weston Park, Shifnal
Cotes, Charles C., M.P....Woodcote, Newport

Members.

Adams, Captain...Underhill, Bridgnorth
Allfrey, R. C....Burleydam, Whitchurch
Amies, Samuel...Stoke Castle, Craven Arms
Anslow, William...Eyton, Wellington
†Ashdown, A. H....Uppington, Wellington
Ashdown, S. Harding...Uppington, Wellington
Austin, Harry C....Wrockwardine, Wellington
Bach, Edward...Cheney Longville, Craven Arms
Bach, Francis...Onibury, Craven Arms
Bach, Philip...Elsich, Bromfield
Backhouse, R. O....Westwood, Bridgnorth
Bailey, George...Lea Hall, Shifnal

Ball, Joseph B....Littleworth House, Newport
Barber, Richard...Harlescott, Shrewsbury
Bate, John William...Astol, Shifnal
Bate, Richard Stokes...Badger, Shifnal
Bateman, J....Croxton Hanmer, Whitchurch
Bateman, Robert... Hanmer Hall, Whitchurch
†Bather, Thomas...Maesbury Hall Mill, Oswestry
Bayley, John...Tilstock, Whitchurch
Beck, Peter...Shrewsbury
†Beckwith, Rev. H....Eaton Constantine, Wellington
Beeston, Thomas..Goldstone Manor, Market Drayton
Belcher, Edward...Moreton Park, Newport
Bibby, J. J....Hardwicke Grange, Shrewsbury
Bickerton, S....Shotatton, Ruyton Eleven Towns
Bickerton, J. E....Sandford Hall, West Felton
Bigge, C. Selby..Bourton Grange, Much Wenlock
Birch, John...Tybroughton, Whitchurch
Blakeway, W....Wooton House, Craven Arms
Blantern, George G....Haston, Hadnall, Shrewsbury
†Borough, C. B....Chetwynd Park, Newport
Botfield, Rev. W. B. Garnett...Decker Hill, Shifnal
Boughey, G. L....Ellesmere
Boulton, W. Baker...Forton Hall, Newport
†Bourn, James...Cleobury Mortimer
Bourne, John...The Arbour Farm, Market Drayton
Bourne, John...Rectory Farm, Market Drayton
Bourne, Thomas...Betton Hall Farm, Market Drayton
Bowen, Edward H....Kingslow, Bridgnorth
Bowen, George...Hadnal, Shrewsbury
Bowen, Humphrey C....Chesterton, Bridgnorth
Bowen, John, jun....Dunvall House, Bridgnorth
Bowen, Thomas...Wootton, Bridgnorth
Bowen, T. B....Blakelands, Claverley, Bridgnorth
Boxford, W. J....Offley Firs, Newport.
Brewster, W....Balderton Hall, Middle, Shrewsbury
Bright, John...Styche, Market Drayton
†Bromley, Richard...Felton Butler, Shrewsbury
Brooke, Rev. John...Haughton, Shifnal
Broughall, Edward...Wikey House, Ruyton Eleven Towns
Broughall, W...Little Fern Hill, Gobowen, Oswestry
†Broughton, P....Tunstall Hall, Market Drayton
Brown, Henry...Preston, Wellington
Brown, John...Weston, Baschurch
Brown, Richard...Ruyton Eleven Towns
Browne, Samuel...Brocton Hall, Shifnal
Buchanan, Phillips....Hales Hall, Market Drayton
Bulkeley, Major...Oak Cottage, Whitchurch
Bullock, James...Hoo Hall Farm, Wellington
Burd, Henry..The Laurels, Shrewsbury
Burd, Thomas A....Burcot, Wellington
Carr, Henry...Larden Grange, Wenlock
Cartwright, T....The Buildings Farm, West Felton
Clay, Charles...Whitchurch
Clay, Edward...Ellesmere
Cocks, John...Dinchope, Wistanston
†Colley, Benjamin...Osbaston, High Ercall
Cooke, Colling...Breadenheath, Whitchurch
Cooke, Lewis Henry...Ellesmere
Cooper, Thomas, jun....Wrockwardine, Wellington
Cope, Edmund...Shawbury, Shrewsbury
†Corbet, H. R....Adderley Hall, Market Drayton
Corbett, Henry...Higford, Shifnal
Corbett, Thomas...Shrewsbury
Corden, Arthur H....Church Aston, Newport
Corden, John...Great Chatwell, Newport
Cottle, George...West Felton, Shrewsbury
†Cotton, Hon. R. W. S...Bourlton Park, Shrewsbury
Coulson, E. Foster...Bellaport, Market Drayton
Crane, Edward...Shrawardine, Shrewsbury
Crane, John...Benthall, Shrewsbury
Crane, Joseph...Bicton, Shrewsbury
Cureton, George...Beam House, Shrewsbury
†Dain, B. J....Park View, Whitchurch
†Darby, Alfred...Little Ness, Shrewsbury
Davies, Arthur F....Bagley, Ellesmere
Davies, James...Felton Butler, Shrewsbury
Davies, James..Plasnewydd, Llanrhaiadr, Oswestry
Davies, Thomas W....Sugdon, Wellington
Davis, Evan H....Patton, Much Wenlock
Davis, G. D....Ightfield Heath Farm, Whitchurch
†De Wend, W. Fenton...Oldbury, Bridgnorth
Dickin, E. T....Yockings Gate, Whitchurch
Dickin, Samuel...Little Ness, Baschurch
Dickin, Thomas...Ellerdine, Wellington
†Dickin, Thomas...Loppington, Wem
Dickin, William...The Lloyd, Market Drayton
Dodgson, W. L....The Moor, Ludlow
Downes, W. E....Great Wollaston, Shrewsbury
Downing, J. M....Dowles (Bewdley)
Downward, John...Tilstock, Whitchurch
Dunn, John...Fernhill Villa, Market Drayton
Eardley, Daniel...The Brand Farm, Market Drayton
Eardley, John...Norton Farm, Market Drayton
†Eddowes, Thomas Henry...Pontesbury
Edwards, Edwin...Brocton Grange, Shifnal
Edwards, G. Withers, jun....Mardee Llandrinio, Oswestry
Edwards, John...Pentre David, Oswestry
†Edwards, John W....Wolston, Oswestry
Edwards, Richard...Adlington, Shrewsbury
†Elwell, Charles...Evelith Manor, Shifnal
Emberton, Charles...Ferney Hough, Ellesmere
Emery, Richard A....Lostford, Market Drayton
Evans, Edward...Newhouse Henlle, Whittington, Oswestry
Evans, John...Allbrighton Farm, Shrewsbury
Evans, John...Uffington, Shrewsbury
Evans, W., jun....Hampton House, Ellesmere
†Everall, Peter...Uckington, Shrewsbury
†Eyton, Thomas C....Vineyard, Wellington
Farmer, John E....Felton, Ludlow
Forester, G. T....Ercall Magna, Wellington
†Foster, W. O....Apley Park, Bridgnorth
Foulkes, J. Griffiths...Llwynymain, Oswestry
Fowler, William...Acton Reynold, Shrewsbury
Fox, John...Coalbrookdale, Wellington
†France, James...Grinshill, Shrewsbury
Frank, John Charles...Rhydairy, Oswestry
Furber, George...Newport
Furnival, Stephen...Napley Farm, Norton-in-Hales
Furnival, William...Bellaport Hall Farm, Market Drayton
Gartside, Wm....Smethcott, Wroxeter, Shrewsbury
†Gatacre, E. Lloyd...Gatacre Hall, Bridgnorth

†Godsall, Phillip W....Iscoyd Park, Whitchurch
Goodall, Brittain..Helshaw Grange, Market Drayton
Goodall, W. H....Sutton, Market Drayton
†Gouldbourn, J...Wilksley, Burleydam, Whitchurch
Gouldbourn, Joseph, jun....Wilksley, Burleydam, Whitchurch
Gower, Andrew...Market Drayton
Grant, Owen E....Shavington, Market Drayton
†Granville, Earl, K.G....Aldenham, Bridgnorth
†Green, George H....Marlow, Leintwardine
†Green, John...Wilcott Manor, Shrewsbury
†Green, Joseph R....Marlow, Leintwardine
Griffiths, John...Houlston, Middle
†Groom, James...Arlston House, Wellington
Hall, Henry...Marchamley Wood, Hawkstone
Hampton, G....High Ercall Mill
Harding, Benjamin...Colehurst Manor, Market Drayton
Harding, E. W....Old Springs, Market Drayton
Harding, John...Alveley, Bridgnorth
Harris, Henry...Long Parish House, Whitchurch
Harris, John J....Stretton Road, Much Wenlock
Harris, Thomas...Moston, Stanton
Hassall, William...Bubney, Whitchurch
Haste, Edwin...Weston, Shrewsbury
†Hawkins, Edmund...Dinthill, Shrewsbury
Haynes, Jesse...Upton Magna, Shrewsbury
Heath, Thomas...Peakwood, Market Drayton
Heatley, John..Broughton, Harmer Hill, Shrewsbury
Heatley, John...Eaton, Market Drayton
Heatley, John...The Daybouse, Newport
Heatley, Thomas...High Hatton, Shawbury
†Heatley, R. T....Eaton Grange, Market Drayton
†Hickman, Thomas...Leaton Lodge, Shrewsbury
Hiles, John B....Weckley, Shrewsbury
Hill, Rev. John...Hawkstone, Shrewsbury
Hinckesman, C. H....Charlcott, Bridgnorth
Holl, W. P....Church Stoke
Hoole, Arthur...Hinnington House, Shifnal
Hopkins, G. O....Darlaston, Prees
†Hornby, Rev. R....Bayston Hill, Shrewsbury
Horton, George...Harley, Much Wenlock
†Horton, S. Lewis...Park House, Shifnal
Horton, Thomas...Harnage Grange, Shrewsbury
Hudson, C. D...Cheswardine, Market Drayton
Hudson, John...The Villa, Ford, Shrewsbury
†Hudson, Samuel...Wytheford Hall, Shawbury
†Hudson, Thomas...Longslow, Market Drayton
Hudson, Thomas...Shoot Hill Farm, Ford, Shrewsbury
Hughes, Thomas...Maesbury House, Oswestry
Humphreys, Edward...Walcot, Chirbury
Hunt, Rowland...Boreatton Park, Shrewsbury
Huxley, Clement...Espley, Market Drayton
Hyslop, William...Private Asylum, Church Stretton
†Ingram, George...Chetwynd Park, Newport
Jenkin, H. B....Cotton Farm, Whitchurch
Jones, F....The Old Hall, Hanmer, Whitchurch
†Jones, J. Bowen...Ensdon House, Montford Bridge
Jones, James...Norville, Bridgnorth
Jones, John...Hall-on-the-Forest, Bettws, Clun
Jones, John...Upton Magna, Shrewsbury
Jones, Thomas...Coleman House, Ellesmere
Jones, Thomas P....Northwood House, Ellesmere
Jones, Rev. William...Baschurch, Shrewsbury
Jones, William...Pikesend, Ellesmere
†Jones, William...Harrington, Shifnal
Juckes, George...Beslow Hall, Wroxeter
†Juckes, R. F....Cotwall, Wellington
Juckes, Thomas...Tern, Wellington
Keary, H. W....Aldenham, Bridgnorth
Kelsall, Thomas...Bettisfield Hall, Whitchurch
Kemp, Joseph H....Longford Farm, Market Drayton
†Kenyon, Hon. E....Macefen, Whitchurch
†Knight, A. J. R. Boughton...Downton Castle Ludlow
Kynaston, Rev. W. C. E....Hardwick, Ellesmere
Lacon, William H....Oswestry
Langford, William...Cherbury Hall
Large, Robert...Henbarns, West Felton
Lawrence, J. W....Bridgwater Arms Hotel, Ellesmere
Lea, James...Dodecote Grange, Market Drayton
Lee, Henry...Ensdon, Shrewsbury
Lee, J. H....Redbrook, Whitchurch
Lee, Thomas S....Brincton House, Shifnal
Leeke, Ralph L....Longford Hall, Newport
†Leighton, Stanley...Sweeny Hall, Oswestry
Lester, Thomas...Ollerton, Market Drayton
Lester, William...Walford, Baschurch
Lewis, George...Mickley Farm, Prees
Lewis, William...Shrewsbury
Lightfoot, F. L....Market Drayton
Litt, William E....Cross Hill, Shrewsbury
†Lloyd, Arthur P....Shawbury, Shrewsbury
Lloyd, G. Butler...Preston Montford, Shrewsbury
†Lloyd, Richard T....Aston Hall, Oswestry
†Loveridge, Samuel...Cosford Farm, Shifnal
Lowe, Isaac...Donnington, Newport
†Lowndes, W. L...Linley Hall, Broseley
Maddocks, Samuel...Hadley, Whitchurch
Mainwaring, R. K....The Hills, Market Drayton
†Mainwaring, Salusbury K...Oteley, Shrewsbury
Mansell, Andrew...Little Ness, Baschurch
†Mansell, Thomas...Hanington Hall, Shifnal
†Mansell, Thomas J....Dudmaston Hall, Bridgnorth
Meire, T. L....Eyton-on-Severn, Shrewsbury
Mellings, John...The Lodge Farm, Bishop's Castle
Meredith, Richard...Rednal, Shrewsbury
Minor, John...The Grove, Kingsland, Shrewsbury
†Minton, John...Forton, Shrewsbury
†Minton, T. S....Montford, Shrewsbury
Moody, General...Caynham House, Ludlow
†More, R. Jasper...Linley Hall, Bishop's Castle
Morris, E. H....West Farm, Chirbury
Morris, John...Llwynrhedeth, Chirbury
Morris, Philip H....Whitchurch
Mort, Charles...Burlton, Shrewsbury
Nevett, William...Yorton, Harmer Hill, Shrewsbury
Newill, Joseph...Lydbury North
†Newport, Viscount, M.P....Weston, Shifnal
Nickolls, James...Tuck Hill, Bridgnorth
†Nightingale, Vaughan E....Burway, Ludlow
Nock, Charles...Norton, Shifnal
Nock, Thomas...Sutton Maddock, Shifnal
†Norris, W. G....Coalbrookdale, Wellington

North, G. F....Cheswardine, Market Drayton
Nunnerley, J. A....Wrentnall, Pulverbatch
Nunnerley, Joseph...Hanmer, Whitchurch
Nunnerley, Richard...Wems Northwood, Wem
Nunnerley, Thomas...Bradeley Green, Whitchurch
Oswell, R. B....Shelrock, Ruyton Eleven Towns
†Oswell, W. B....Eardiston House, West Felton
Owen, D. H....Great Ness
†Owen, F. B....Deefield, Ellesmere
†Owen, John...Kinton, Baschurch
†Owen, J. D....Deefield, Ellesmere
Palmer, Robert...Nagington, Market Drayton
†Parry, Charles...Houghton, Ellesmere
Pay, John...Watergate Street, Ellesmere
†Payne, William...Willcott, Neseclift
†Peck, Edmund...Plas-y-Ddinas, Shrewsbury
†Perry, Graddon...Acton Pigott, Condover
Perry, W. H....Sytch House, Claverley, Bridgnorth
Phillips, G. T....Brockton Leasowes, Newport
Picken, William...Hilton, Newport
Platt, John...Belle Vue, Wem
Plowden, W. F....Plowden Hall, Lydbury North
†Poole, C. H....Marbury Hall, Whitchurch
Poole, Jeffrey...Chilton, Atcham, Shrewsbury
Povey, Henry...Ellesmere
Powell, T. P....Marchamley, Hawkstone
Preece, W. G....Shrewsbury
Price, Andrew...Bagley, Ellesmere
†Pritchard, John...Stanmore, Bridgnorth
Proctor, James...Ironbridge
Pugh, Elisha...The Beech, Bishops Castle
Pugh, George...Wheathill, Wellington
Purton, C. C... The Woodhouse, Cleobury Mortimer
Radcliffe, Thomas...Cheswell Grange, Newport
Rainforth, Edward...Ruthall Manor, Bridgnorth
†Ralph, R. W....Hoonington Grange, Newport
Randles, John B....Old Heath Farm, Shrewsbury
Randles, S. Jordan...Yockleton, Shrewsbury
Ravenshaw, Henry...Ash Hall, Whitchurch
Ravenshaw, James...Moreton Hall, Market Drayton
Richards, Edward...Macsbury, Oswestry
Richards, Richard...Glascoid, Llansilin, Oswestry
Rider, William...Crudgington, Wellington
Ridge, John...Rhysnant, Llanymynech
Roberts, J. H....Fenns Wood House, Whitchurch
Roberts, T. Lloyd...Corfton Hall, Bromfield
Rogers, Thomas...Bucknell
†Rouse-Boughton, Sir C. H., Bart....Downton Hall, Ludlow
Sheraton, John Robinson...Ellesmere
Sheraton, William...Broom House, Ellesmere
Shingler, J. H....Birch Hall, Ellesmere
Shuker, John...Keighley Hall, Chirbury
Simon, Thomas...Fern Hill, Market Drayton
Simpson, John...Winnington, Market Drayton
Sing, William...Newton, Bridgnorth
Sladen, F. St. Barbe...Leighton Hall, Ironbridge
Slaney, John...Purville House, Wellington
Smith, E. Bremner...Oswestry
Smith, Mrs. H. .New House, Sutton Maddock, Shifnal
Smith, Henry...Harnage, Shrewsbury
Smith, R. Thursfield...Whitchurch
Smyth, Sir C. F., Bart....Acton Burnell, Shrewsbury
†Smythies, George...Leintwardine, Shrewsbury
Spence, Henry...Heath Lodge, Shrewsbury
†Spencer, Edwin...Ashford, Carbonel, Ludlow
Sprott, James...College Hill, Shrewsbury
†Stanier, Francis...Peplow Hall, Market Drayton
Stanley, Henry...Upton, Shifnal
Steedman, E. B....High Ercall Hall, Wellington
†Steward, T. L....Crudgington, Wellington
Summers, Thomas, jun....Cowgreaves, Shifnal
Tanner, Alfred...Shrawardine, Shrewsbury
Taylor, Edward...Whitton, Leintwardine
Taylor, Richard...Sidney House, Wellington
Taylor, William H....High Hatton, Shawbury
Tench, John...Ludlow
Theobald, Horace... Adderley Lodge, Market Drayton
Thomas, Edward...Victoria Parade, Oswestry
Thomas, Richard...The Buildings, Baschurch
Thomas, Thomas...Treprenal, Oswestry
Thompson, T. Warren..Claremont Bank, Shrewsbury
Thornburn, Robert...Condover Grove, Shrewsbury
Thornily, Samuel...Shooters Hill House, Wem
Thursfield, Thomas H....Barrow, Broseley
Tilsley, Robert...Bellaport, Market Drayton
Timmis, R....Dryton, Wroxeter
Titterton, J. Ward...Shifnal
Topham, Robert...Elson, Ellesmere
Topham, Thomas...The Twemlows, Whitchurch
Tyrwhitt, Sir H., Bart....Stanley Hall, Bridgnorth
Underhill, W. S....Newport
Vaughan, Edward...Alford Farm, Middle, Shrewsbury
Vaughan, W....The Lodge, Ruyton Eleven Towns
Vernon, Benjamin...Aychley, Prees
Wade, Arthur F. S....Condover, Shrewsbury
Wadlow, E. C....Arkleton, Bridgnorth
Wain, George..The Bowney Farm, Market Drayton
Wainwright, Richard...Sweeny, Oswestry
†Wakeman, E. M....Colton Hall, Bridgnorth
†Wakeman, Sir Offley, Bart.....Borrington Lodge, Chirbury
†Wakeman-Newport, H. A.....Coton Hall, Bridgnorth
†Walford, John H. R....Ruyton Eleven Towns
Walker, William...Lilleshall Hill Farm, Newport
Ward, Edward W....Crickheath, Oswestry
Ward, Thomas A....Ellerton, Newport
Ward, William...Knockin Heath, West Felton
Warter, H. de Grey...Longden Manor, Shrewsbury
Wedgwood, A. E...Breadenheath, Ellesmere
Weston, Philip...Coalbrookdale, Wellington
Wheeler, G. W....Posen Hall, Broseley
Whitaker, James...Hampton Hall, Worthen
Whitfield, Edward...Oswestry
Whitfield, Thomas...Ashford Grange, Prees
†Whitfield, T. N....Lostford, Market Drayton
†Whitmore, Rev. F. H. Wolryche..Dudmaston Hall, Bridgnorth
Whittingham, L. B....Llandrinio Hall, Oswestry
Wilding, James...Walton, Wellington
†Wilkes, Martin...Claverley, Bridgnorth
Williams, Hugh...Chesterton, Bridgnorth
Williams, Matthew...Lea House, The Mount
Williams, Thomas N....Pool Head, Wem

Wilson, Rev. Hugh Owen...Church Stretton
Wilson, John...Aston Hall, Claverley, Bridgnorth
Wilson, J. S....South Lodge, Norton, Shifnal
Wingfield, C....Onslow Hall, Shrewsbury
Wood, Edward...Culmington Manor, Bromfield
†Wood, E. T. W....Henley Park, Ludlow
Wood, John...Ightfield Hall, Whitchurch
†Woodburn, Myles...Kenwick, Shrewsbury
Woodcock, Samuel...Churlton House, Pulverbatch
Woolrich, Joseph...Old Marton, Oswestry
Wright, Edmund...Halston, Oswestry
†Wyer, Richard H....Wyke, Much Wenlock
Wyley, Henry James...Bridgnorth
†Wyley, William...Roughton, Bridgnorth
†Wyley, W. John...Admaston, Wellington
Yates, Frank G....Ironbridge
Yates, William...Grindle House, Shifnal

SOMERSETSHIRE.

Governors.

Bridport, Gen. Viscount...Cricket St. Thomas, Chard
Dickinson, Francis Henry..King's Weston, Somerton
†Popham, F. L..Hunstrete House, Chelwood, Bristol
Smyth, Sir J. H. Greville, Bart....Ashton Court, Bristol

Members.

Abraham, Thomas...Dunster, Taunton
Allen, Major Ralph S., M.P....Bathampton, Bath
†Aplin, Henry...Coombe St. Nicholas, Chard
Ashford, E. C., M.D....The Moorlands, Bath
Badcock, Henry Jefferies...Taunton
†Bailey, James...Burnham, Bridgwater
†Barker, G. I. Raymond...17, Royal Crescent, Bath
†Barton, Charles...Holbrook House, Wincanton
†Batten, John...Yeovil
Bell, J. Williams...Gillingham, Bath
Bennett, T. O., jun....Tolbury, Bruton
Bird, William...Volis, Kingston, Taunton
Blake, Thomas...Cutsey, Wellington
Blake, William...Bridge, Ilminster
Bond, James H....Heathfield, Taunton
Boon, James...Up Lyme, Axminster
†Bowerman, Alfred...Capton, Williton, Taunton
Bradbeer, John...Pyrland Hall Farm, Taunton
†Braikenridge, J. H....Chew Magna, Bristol
Broderip, Edmund...Cossington, Bridgwater
†Bruford, Nicholas...Tolland, Wiveliscombe
†Bullen, John T....Marshwood Manor, Crewkerne
Bullen, William...Wayford Farm, Crewkerne
†Bullock, George...East Coker
†Bult, James S....Dodhill House, Kingston, Taunton
Busfield, W....Charlton, Radstock, Bath
†Capel, Arthur...Bulland Lodge, Wiveliscombe
†Cartwright, F. F....8, Windsor Terrace, Clifton
Chaffey, Ebenezer...Reinton Mandeville, Somerton
†Clarke, T. E....Long Run, Taunton
†Clerk, E. H...Burford, Shepton Mallet
Coates, S. Baker...Stanton Drew, Bristol
Colthurst, John...Chew Court, Chew Magna, Bristol
Cope, E. G....Pembroke Road, Clifton, Bristol
Corner, Richard...Torweston, Taunton
Crang, Findlater...Timsbury, Bath
Culverwell, James C....Clavelshay, Bridgwater
Culverwell, William T....Durley Farm, Bridgwater
Davis, John G....Blagroves, Milverton, Taunton
†Dean, A. Keball....East Brent, Axbridge
†Dean, F. Keball...East Brent, Axbridge
†Dickinson, E. H....Berkeley, Frome
†Duckworth, Russell...The Cloisters, Bath
Dunn, N. J....15, Victoria Square, Clifton
Dyke, Thomas...Ashton Lodge, Bristol
Easton, Richard...Stone House, Taunton
Easton, William...6, Hammet Street, Taunton
Edwards, Charles...The Grove, Wrington
Edwards, Joseph...Hutton, Weston-super-Mare
England, John...Chard
Fane, Edward...Clovelly Court, Fitzhead, Taunton
†Farthing, Walter...Stowey Court, Bridgwater
Ford, James...Wraxall Court, Nailsea
Fussell, Rev. James G. C....The Chantry, Frome
Galton, E....Loxton, Weston-super-Mare
Gibbons, George...Tunley Farm, Bath
†Gibbs, George...Belmont, Bristol
Gibbs, W. S....Manor House, Cothelstone, Taunton
Goodwin, Josiah...Bath
†Gray, G. W....Castle Carey
†Gray, Jonathan... Backwell Hill, Bristol
†Grenville, R. Neville, M.P..Butleigh Ct., Glastonbury
†Grove, Miss...Zeals House, Bath
†Halliday, J....Chapel Cleeve, Taunton
Hancock, J. D....Halse, Taunton
Harbin, George...Newton House, Yeovil
Harding, Joseph...Stourton, Bath
Harding, T. King...Maiden Bradley, Bath
†Harford, J. B....Blaise Castle, Henbury, Bristol
†Harford, W....Barley Wood, Wrington, Bristol
Hellier, W. G....Wick St. Lawrence, Weston-super-Mare
Helyar, W. H....Coker Hall, Yeovil
†Henley, H. C....Leigh House, Chard
Hewett, W. H....Norton Court, Taunton
Hicks, G. H. T....Hill Grove, Wells
Hill, George J....Hill House, Mangotsfield, Bristol
†Hippisley, John...Stone Easton, Bath
Hodlinott, James...Lipyeat, Bath
†Hood, Sir A. A., Bart...St. Audries, Taunton
†Horner, John F. F....Mells Park, Frome
Hosegood, Obed...Dillington, Ilminster
†Hoskins, Thomas...Haselbury, Crewkerne
†Hylton, Lord... Ammerdown Park, Radstock, Bath
†Keen, John R....Chewton Farm, Stone Easton, Bath
†Kensington, E. T....Weston-super-Mare
†Kettlewell, W. W....East Harptree, Bristol
†Kidner, Samuel...Milverton
Kidner, William...Kingston, Taunton
King, G. F....Elm Farm, Chewton, Bristol
King, R. King Meade...Walford, Taunton
†Knatchbull, William...Babington, Frome
Knollys, J. E....Fitzhead Court, Taunton
Lang, T. M....Westport, Curry Rivell
Langton, S. Gore...Newton Park, Bristol

†Langton, W. H. P. Gore...Newton Park, Bath
†Lee, Vaughan H....Dillington Park, Ilminster
Lethbridge, A. G....Eastbrook House, Taunton
Lethbridge, Sir W. A., Bart...Sandhill Park, Taunton
†Lovell, Edwin...Dinder, Wells
†Lovell, E. W. Lovell...Dinder, Wells
Luttrell, Rev. A. H. F..Minehead Vicarage,Taunton
†Luttrell, G. F....Dunster Castle, Dunster
Luttrell, Colonel H. A. F....Badgworth Court, Weston-super-Mare
Male, Henry...East Chinnock, Yeovil
Mathews, H. C. L....Henbury, Bristol
Meade-King, Herbert...Ellinthorp, Stoke-Bishop, Bristol
Mildmay, A. St. John...Hollam, Dulverton
†Miles, J. W....King's Weston, Bristol
†Miles, P. W. S....61, Queen Square, Bristol
†Miles, Sir Philip, Bart....Leigh Court, Bristol
Mirehouse, Henry J....Easton-in-Gordano, Bristol
Moor, H. P....Queen Charlton Manor, Bristol
Morgan, Sydney S. H....Long Ashton, Bristol
†Moysey, Henry G...Batheaton Court, Wiveliscombe
†Naish, W. B....Stone Easton, Bath
†Napier, E. B....Pennard House, Shepton Mallet
Neville, Robert...Butleigh Court, Glastonbury
Nichols, George...Long Ashton, Bristol
Osbourne, J. S....Heath House, Stapleton, Bristol
Ostler, John...Isle Brewers, Taunton
Paget, Edward...Burnett, Bristol
†Paget, Major R. H., M.P...Cranmore Hall, Shepton Mallet
Parham, Edmund...Bristol
Parham, William...Bath
Parnell, Alfred...Walls Court, Stapleton
†Parsons, George...Martock
†Parsons, Henry...Haselbury, Crewkerne
†Paull, Charles...21, East Street, Taunton
†Paull, J. W....Knott Oak House, Ilminster
Penny, Thomas...Taunton
Peren, W. B....Compton, South Petherton
Pinney, Col. W...Somerton Erleigh, Taunton
Pitman, S. C. B....Bishops Hall Manor, Taunton
Potter, Worthy...Queen Charlton, Keynsham
Rayer, W. Carew...Holcombe Court, Wellington
Robinson, A. R....Bathurst Wharf, Bristol
Robinson, John...Backwell House, Bristol
Skinner, Alfred C....Bishop's Lydeard, Taunton
Skrine, H. D....Warley Manor, Bath
†Smith, William...Sandon House, Clifton, Bristol
†Somerville, J. C....Dinder House, Wells
Spackman, H....Bloomfield House, Bath
†Sparks, William...Crewkerne
†Speke, W., jun....Jordans, Ilminster
†Spurr, Anthony...West Coker, Yeovil
†Steeds, Albert J....Holcombe, Bath
Strangway, H. B....Shapwick, Bath
Stuckey, H....Cannington, Bridgwater
†Surtees, W. E....Tainfield House, Taunton
Tanner, Edward...Clapton Court, Crewkerne
Taylor, Henry...7, Windsor Terrace, Clifton
†Trevilian, Edwin C....Curry Rivel, Taunton
†Wainwright, Charles R....Shepton Mallet
Warry, George...Shapwick, Bridgwater
Were, Francis...Gratwicke Hall, Barrow Gurney
Wightman, John...Chard
Wollen, Joseph...Wedmore
Woodforde, F. H., M.D...Amberd House, Taunton
Woolley, John T....Stockton, Bath

STAFFORDSHIRE.

Governors.

†Buller, Sir E. M., Bt....Dilhorne Castle, Cheadle
†Dartmouth, Earl of..Patshall Hall, Wolverhampton
Lichfield, Earl of...Shugborough
†Sutherland, Duke of, K.G....Trentham Hall

Members.

Abbotts, R. W....Burton-on-Trent
†Addison, S. T....Edenhall, Eccleshall
†Allsopp, S. C., M.P....Marchington, Uttoxeter
Alsop, William, jun....Cotes Lodge, Stone
Arnold, William...Lichfield Street, Tamworth
Aston, W....Selsdon, Wolverhampton
Averill, Charles, jun....Pyrehill, Stone
Averill, E....Wood Gate, King's Bromley, Lichfield
Averill, George Hanson...Wood End, Lichfield
Bagnall, George...Draycot, Stoke-on-Trent
Bagnall, W. G....Stafford
†Bagot, Lord...Blithefield, Rugeley
Ball, Henry...Crossfields, Stafford
Bamford, Henry...Uttoxeter
Bantock, T....Merridale House, Wolverhampton
Barnett, T. J....Tettenhall Road, Wolverhampton
Barratt, C. Underwood...Eccleshall
Barton, J. Pipe...Bangley, Tamworth
Bass, Michael T., M.P....Burton-on-Trent
Bate, Samuel...Springfields, Newcastle-under-Lyme
Beach, Joseph...Brewood, Penkridge
Beach, Mrs....The Hattons, Brewood
Bealey, J. Edward...Bloxwich, Walsall
Bennett, Ralph...Lichfield Road, Walsall
†Bennion, Owen...Cresswell, Stafford
Best, Henry D....Bilston
Bill, John...Trent Vale, Stoke-on-Trent
Birch, James...Pearse Hay, Penkridge
Bird, John...Hammerwick, Lichfield
Blurton, Edward...Wolverhampton
Blurton, W. Mountfort...Field Hall, Uttoxeter
Bond, Benjamin...Draycot, Stoke-on-Trent
Bolam, H. G....Little Ingestre, Stafford
Booker, Thomas...Sutton (Newport, Salop)
Booth, Daniel...Audley, Newcastle
Booth, John...Shenstone Hall, Lichfield
Booth, Thomas...Tamborne Park, Lichfield
Boothby, C. E....Needwood Forest, Burton-on-Trent
Bostock, Edwin...The Haugh, Stafford
Bostock, Thomas ..Waterloo House, Burslem
Bourne, John...Hildenstone, Stone
Bradburne, J. Hanbury...Pipe Place, Lichfield
Brawn, James...Shenston, Lichfield

Brawn, John...Sandhills, Walsall
Brealey, John...Leek
†Brewster, John...Stretton Mill, Penkridge
†Briggs, Thomas...Fisherwick, Lichfield
†Briscoe, Arthur...Vale Head, Wolverhampton
†Briscoe, R. H....Somerford Hall, Brewood
Brookfield, Walter C....Stafford
Broomhall, T. T., M.D....Beech Cliff, Newcastle
Brough, Edwin...Ballhaye Park, Leek
Brough, William S....Fowlchurch, Leek
Brown, Charles...Park Hall, Leigh, Cheadle
Brown, John N....Anglesey House, Handsworth
Brown, Robert...Wiggington House, Tamworth
†Buller, Morton Edward...Dilhorne, Cheadle
Burchnall, Samuel...Catton, Burton-on-Trent
Burnett, James...Sherral Park, Tamworth
Butler, W....The Cedars, Compton, Wolverhampton
Byrd, Charles...Littywood, Stafford
†Carrington, William T...Croxden Abbey, Uttoxeter
Cartwright, H. J....Waterloo Road, Wolverhampton
Cartwright, Robert..Palmers Green, Wolverhampton
Cartwright, Sidney..The Leasowes, Wolverhampton
Challenor, John..Blackwood, Endon, Stoke-on-Trent
Challinor, William...Pickwood, Leek
Chawner, Henry...Hound Hill, Uttoxeter
Cheatle, T. Farmer...Dosthill, Tamworth
†Clarke, Charles F... Purton Grove, Wolverhampton
Cleminson, Robert...Endon, Stoke-on-Trent
Clifford, Sir Charles, Bart...Hatherton Hall, Cannock
Clifft, Samuel...Fordhouse Mill, Wolverhampton
Coath, William...The Shrubberies, Walsall
Collins, William...Aston Farm, Stone
Colvile, Captain A. H. A....Churnett Grange, Leek
Coxon, John...Freeford Farm, Lichfield
Crisp, Charles E....Alrewas, Lichfield
Crossman, A....Barton-under-Needwood, Burton-on-Trent
Crowley, John L....Horsebrook, Stretton, Penkridge
†Darling, J....Beau Desert, Rugeley
Davenport, James E....Medford Hall Farm, Stone
Dawson, A. F....Barrow Hill, Uttoxeter
Davis, Robert A., M.D....Burntwood, Lichfield
De Clifford, Lady...Hints, Tamworth
Denton, Henry...Wolverhampton
Dester, William...Seckington, Tamworth
Dixon, Edwin...Merridale Grove, Wolverhampton
Douglas, J. Bryant...Lullington, Burton-on-Trent
Dutton, Charles...Lyttleton Street, West Bromwich
Dyott, Col., M.P....Freeford Manor, Lichfield
Edge, Joseph...Cobridge, Stoke-on-Trent
†Elwell, Charles John..Union Street, Wolverhampton
Evans, Alfred, jun....High Street, Stone
Every, Sir H. F., Bart ...Egginton Hall, Burton-on-Trent
†Farmer, C. Haywood...Comberford Hall, Tamworth
†Farwell, Frederick G....Wolverhampton
Fellows, T. G....Long House, Cannock
†Fellows, Titus...Great Wyrley Hall, Walsall
Fitzherbert, Sir W., Bt...Somersall Herbert, Uttoxeter
†Fitzherbert, William...Swynnerton, Stone
Foden, Edward ..Teddesley, Penkridge
†Forster, Charles, M.P....Lysways Hall, Rugeley
Forsythe, James...Wolverhampton
†Fowler-Butler, Captain R.....Barton-under-Needwood, Burton-on-Trent
†Fox, George...Elmhurst Hall, Lichfield
Fuller, W. A....Chapel Ash, Wolverhampton
Gibbs, Thomas...Geary House, Bretby, Burton-on-Trent
Giffard, Walter T. C....Chellington, Wolverhampton
Gillard, Henry...Stafford
Gilman, John...Middleton, Tamworth
Ginders, Samuel...The Hough, Stafford
†Glover, John...Lichfield Street, Tamworth
†Glover, Robert...Blackbrook, Lichfield
Gough, Ralph D....Willenhall
Griffith, G....Wolverhampton Road, Stafford
Grylls, T. H....Tixall Cottage, Stafford
Hadderton, Henry...Acton Mill, Eccleshall
Hall, John P....Cockayne House, Uttoxeter
†Hardy, John...Dunstall Hall, Burton-on-Trent
Hardy, Richard...Marchington, Uttoxeter
Harrison, Colonel J....Norton Hall, Cannock
Hart, Henry R....Cannock
Hartill, J....Wednesfield, Wolverhampton
Harwood, William...Furze Farm, West Bromwich
Hatherton, Lord...Teddesley, Penkridge
Haughton, William...Berryfield Farm, Aldridge, Walsall
Haynes, Henry...Drayton Bassett, Tamworth
Heath, Robert, M.P....Biddulph Grange, Stoke-on-Trent
Heatley, J. H....Engleton Hall, Penkridge
Heatley, Thomas...Pattingham, Wolverhampton
Hewson, John Dale, M.D....Coton Hill, Stafford
Higgott, William, jun....Branston, Burton-on-Trent
Higgs, Albert A....Walton Hurst Farm, Eccleshall
†Higgs, J. Birch...Coven, Wolverhampton
Hill, A. Staveley, M.P.....Oxley Manor, Wolverhampton
Hill, John W....The Retreat, Compton, Wolverhampton
†Hiron, Samuel...Elford Lowe, Tamworth
Holland, Trevor...Oak Fields, Rugeley
Holland, William...Streethay, Lichfield
Hollis, Henry W....Keele, Newcastle
Horsfall, T. B....Bellamour Hall, Rugeley
Horsley, E. H....Colton, Rugeley
Horton, Enoch..New Oxley Farm, Wolverhampton
Hulme, Thomas...Endon, Stoke-on-Trent
Inge, Charles H....Whittington Hurst, Lichfield
Inge, Rev. George...Thorpe Constantine, Tamworth
Jackson, Thomas...Drayton Bassett, Tamworth
James, Frank...Aldridge, Walsall
James, John...Sandon Hall Farm, Stone
James, Thomas...Shushions Manor, Church Eaton
Jenks, Thomas...Orton, Trysull, Wolverhampton
Jenks, William...Upper Fenn, Wolverhampton
Keeling, C. R....Congreve, Penkridge
Keeling, F. J....The Park, Coven, Wolverhampton
Keeling, G. B....Hampton House, Penkridge
Kendrick, Edward...Wecford, Lichfield
Knight, Edward...Sandon, Stone
Knight, John L....Barton-under-Needwood
Knight, Josiah...Milwich, Stone
†Kynnersley, C. T. Sneyd...Highfields, Uttoxeter
Landor, W. J....Lee Hall, Rugeley

†Lane, Lieut.-Col....King's Bromley Hall, Lichfield
†Leaver, Francis...Longnor Hall, Penkridge
†Leigh, A. Egerton...Acton Hill, Stafford
Lewisham, Viscount...Patshull, Wolverhampton
†Locker, William T....Aston, Stone
Lovatt, Henry...Bushbury, Wolverhampton
Lowe, Edward...Comberford Mill, Tamworth
Lowe, Richard...High Green, Wolverhampton
Lyon, Charles Edward...Johnson Hall, Eccleshall
Madan, Martin...Lichfield
Mainwaring, Rev. C. H....Whitmore, Newcastle
Major, John C....The Bhylls, Wolverhampton
†Manley, A. E....Manley Hall, Lichfield
Marson, John...Acton Mill, Stafford
Martin, E. Hall, jun....Barr Hill, Madeley
†Masfen, R. H....Pendeford, Wolverhampton
Mathews, John W....Acton Trussell, Stafford
Matthews, Charles..Cleveland Road, Wolverhampton
†May, G. A....Elford Park, Lichfield
Mayou, J. Webster...Fazeley, Tamworth
†McLaughlin, W. G....Wilnecote House Tamworth
Menzies, George...Trentham, Stoke-on-Trent
Miller, J. Norton...Pattingham, Wolverhampton
†Milligan, Major...Cauldwell Hall, Burton-on-Trent
†Millington, W., M.D....Old Fallings Hall, Wolverhampton
Mills, Edward...Aldridge, Walsall
Mills, Thomas...Wolverhampton
Minor, A. Henry...Kiddermore, Penkridge
Minors, J. T....Wolverhampton
†Monckton, Francis...Stretton Hall, Penkridge
Moreton, J.....Moseley Court, Bushbury, Wolverhampton
†Morris, C. J....Wood Eaton Manor, Stafford
Morris, Sir John. Wightwick House, Wolverhampton
Mort, F. D....Eastlands, Stafford
Mosley, Sir Tonman, Bart....Burton-on-Trent
Mousley, E. J....Galgate Street, Stafford
Myatt, James...Enson, Moor, Stone
Myatt, James...College Farm, Walsall
†Mynors, W. C. T....Tixall, Stafford
†Negus, Thomas A....Lynn House, Walsall
†Newdigate, F. W..Byrkley Lodge, Burton-on-Trent
†Nicholson, Arthur...Stockwell House, Leek
Okeover, H. C....Okeover (Ashbourne)
Owen, John...George Hotel, Lichfield
Pearce, John...Heath House, Oaken, Wolverhampton
Peel, Right Hon. Sir R., Bart., M.P....Drayton Manor, Fazeley
†Peile, Rev. T. W....Cannock Vicarage
†Perry, Rev. E. C....Seighford, Stafford
Perry, F. C....Dunston, Penkridge
Perry, Thomas J....Wergs Hall, Wolverhampton
†Philips, John C....Cheadle, Stoke-on-Trent
Philips, J. W....Heybridge, Cheadle
Plant, Edward...Burley Fields, Stafford
Power, W. S....Brancote, Stafford
Poyser, Josiah T....Burton-on-Trent
†Pratt, C. Alfred...Bloxwick Mill, Walsall
Pullen, Richard...Standeford Mill, Wolverhampton
Pursell, R. R....Oxley, Wolverhampton
Ratcliffe, J. Morris...Silverdale, Newcastle
Richardson, F. E .. Bramshall, Uttoxeter
†Richardson, J. H. ..Kings Standing, Burton-on-Trent
†Ridgway, John...Sheldon, Stoke-on-Trent
Robinson, Thomas...Tatenhill, Burton-on-Trent
Robotham, A....Drayton Basset, Tamworth
†Rogers, Henry...Wolgarstone, Penkridge
Rogers, W. H....Goldthorne Villa, Wolverhampton
Round, Samuel...The Hollies, Cheddleton, Leek
†Salt, Thomas, M.P....Weeping Cross, Stafford
Sandon, Lord, M.P....Sandon Hall, Stone
Sankey, Thomas...Burntwood, Lichfield
Scott, Thomas J....Tettenhall Road, Wolverhampton
Senior, James...The Pennicroft, Stafford
Shakeshaft, Edward...St. Mary's Square, Lichfield
Shaw, George...Day Hills, Stone
†Shaw-Hellier, Capt....Wimborne, Wolverhampton
Shaw, W. S....Fradley Old Hall, Lichfield
Shelton, J. M...Springfield, Oaken, Wolverhampton
Shelton, W. G.....The Grange, Wergs, Wolverhampton
Shenton, Isaac...Home Farm, Hints, Tamworth
Shufflebotham, S....Moor Hall, Madeley, Newcastle
Smith, Henry...Summerhill, King Swinford, Dudley
†Smith, T. Carrington...Admaston, Rugeley
Smith, William...Broad Fields, Lichfield
Sneyd, Rev. Walter...Keele Hall, Newcastle
Sollom, Francis...Pennfields, Wolverhampton
Stanley, Henry..Yield Field Hall, Bloxwich, Walsall
Starkin, John...Blizlincote, Burton-on-Trent
Steele, John...Hay House, Penkridge
Stokes, George...Hints, Lichfield
Strongitharme, G....Rushall, Walsall
Stubbs, Samuel...Bridgford, Stafford
Stubbs, William...Rickerscote, Stafford
Sudbury, Richard...Stafford
Sweetnan, Henry H....Bilbrook, Wolverhampton
Swift, George...Hanchurch, Newcastle
Symons, Frederick...Lichfield
Taylor, George...Dudley
Taylor, Henry...Pattingham, Wolverhampton
Taylor, William...Stretton, Penkridge
Thompson, William...Walton, Stone
Till, Rev. J....Gnosall Vicarage
Timmis, Charles...Brick House, Stafford
Timmis, John...Rugeley
Tomkinson, William...Newcastle
Tompkin, S....Woodhouse, Whitmore, Newcastle
Tongue, Captain...Manor House, Aldridge, Walsall
Troutbeck, George...Barton-under-Needwood
†Tudor, G. S....Park House, Lapley, Penkridge
†Turnor, E. Weston...Brereton, Rugeley
Twemlow, Thomas T....Betley Court (Crewe)
Twentyman, A. C....Castlecroft, Wolverhampton
†Vaughan, Edmund M....Lapley, Penkridge
Vernon, H. C....Hilton Park, Wolverhampton
Wade, George....Westbrook, Ludlington, Burton-on-Trent
Walker, Robert Hay...Chillington, Wolverhampton
Walker, Samuel...Tutbury, Burton-on-Trent
Walton, Warren...Burton-on-Trent
†Ward, George...Bearnett House, Wolverhampton

†Ward, Henry...Rodbaston, Penkridge
†Wardle, Henry...Highfield, Burton-on-Trent
Wardle, Thomas.. Madeley, Newcastle
†Webb, Charles J....Elford House, Tamworth
Webb, Henry C....Queensville, Stafford
Wibberley, Thomas...Manor House, Walton, Stone
†Wiggin, Henry...Metchley Grange, Harborne
†Wight, C. B....Rudge Hall, Wolverhampton
Wilde, Edward...Sandyford, Stone
Wilkinson, C. T....Hoar Cross, Burton-on-Trent
Williams, Walter...Sugnall Hall, Eccleshall
Winterton, Thomas...Walton Warren, Burton-on-Trent
†Wolferstan, F. S. P....Statford Hall, Tamworth
Wolseley, Sir C. M., Bart....Wolseley, Stafford
Wood, John...High Street House, Uttoxeter
Woodcock, Richard..Darlington St.,Wolverhampton
Woodroffe, David...Chase View, Rugeley
†Woolley, Thomas...Newton Regis, Tamworth
†Wrottesley, Lord...Wrottesley, Wolverhampton
†Wyatt, Robert...Acton Hill, Stafford
Wyley, James...High Onn, Stafford
Wynne, Thomas...Manor House, Gnosall
Zouche, Lord...Ravenhill, Rugeley

SUFFOLK.

Governors.

†Duleep Singh, His Highness the Maharajah..Elveden Hall (Thetford)
Grafton, Duke of...Euston (Thetford)
Kerrison, Sir E. C., Bart....Brome Hall (Scole)
†Stradbroke, Earl of....Henham Park, Wangford

Members.

†Allix, W. T....Campsea Ash, Wickham Market
†Anstruther, J. H. L....Hintlesham Hall, Ipswich
Barber, J. Lee...Flixton, Lowestoft
Barlow, Colonel F....Hasketon, Woodbridge
Baskett, Nathaniel...Wetheringsett, Stonham
†Bates, George W...Northgate St., Bury St. Edmund's
Bedingfield, Lieut. James, R.N....Bedingfield, Eye
†Bence, Captain...Kentwell Hall, Long Melford
Bence, Henry A....Thorington Hall, Saxmundham
Benyon, Rev. E. R....Culford, Bury St. Edmund's
†Berners, John...Holbrook, Ipswich
Bevan, Beckford...Bury St. Edmund's
†Biddell, Herman...Playford, Ipswich
†Biddell, Manfred...Playford, Ipswich
†Biddell, William...Lavenham Hall, Sudbury
†Boby, Robert...Bury St. Edmund's
Boldero, John...Rattlesden, Woolpit
Branwhite, F....Chapel House, Long Melford
Bristol, Marquis of...Ickworth, Bury St. Edmund's
†Bromley, Joseph R....Playford Mount, Woodbridge
Brooke, H....Wetheringsett, Stonham
Brooke, John W....Sibton Park, Yoxford
†Bunbury, Sir C., Bart....Great Barton Hall, Bury St. Edmund's
†Burrell, R....Westley Hall, Bury St. Edmund's
Burroughes, Rev. T....Gazeley (Newmarket)
Byford, William...The Court, Glemsford
†Cartwright, R. Norton...Flixton, Bungay
Catchpole, Nathaniel...Bramford, Ipswich
Chapman, William...Crescent Road, Ipswich
†Clayton, E. E...Guildhall Street, Bury St. Edmund's
Cobbold, John Chevallier, M.P....Ipswich
Cocksedge, James S....Stowmarket
Cooke, Robert C....Livermere, Bury St. Edmund's
Cooper, J. R.....Barton, Bury St. Edmund's
Corrance, F. S....Broadwater, Framlingham
Cracknell, A....The Grove, Thornham, Eye
Crisp, Arthur W....Orford, Wickham Market
†De Grey, Hon. and Rev. F..Copdock Rectory, Ipswich
Delf, S. Newton...Longwood House, Bungay
Dunning, Rev. W. B....Mickfield Rectory, Stonham
†Easterson, Thomas...Deerbolts Hall, Stonham
†Everett, W. S....Carlton Colville, Lowestoft
Everette, F. H....Regent House, Aldborough
†Fison, Albert J....Barningham Hall, Ixworth
†Fowler, Robert C....Gunton Hall, Lowestoft
French, Richard Day...St. John's, Bungay
†Frost, Charles...Wherstead, Ipswich
†Gardiner, S....Wheatacre All Saints, Beccles
Garrard, Frank R....The Hall, Framlingham
Garrard, Robert..Brundish Grove, Wickham Market
Garrett, Frank...Aldringham House, Saxmundham
†Garrett, Richard...Carleton Hall, Saxmundham
Gilstrap, Wm...Fornham Park, Bury St. Edmund's
Gooderham, George...Monewden, Wickham Market
Greene, Edward, M.P....Nether Hall, Bury St. Edmund's
Grimwade, Edward...Ipswich
Grout, John...Woodbridge
†Gurdon, William...Brantham (Manningtree)
†Gurteen, Daniel...Haverhill
Guy, George F....Angel Hill, Bury St Edmund's
†Hamilton, Duke of...Easton Park, Wickham Market
Harvey, William...Timworth, Bury St. Edmund's
Harwood, Thomas...Belstead Hall, Ipswich
†Hawkins, Thomas...Bentley Hall, Ipswich
Hayward, Frederick...Needham Market
Head, John...Ipswich
†Hempson, John A....Erwarton Hall, Ipswich
Henniker, Lord.. Thornham Hall, Eye
†Hodgson, E. G...Charsfield Hall, Wickham Market
Horton, Admiral...Livermere, Bury St. Edmund's
†Jacobson, C. C....Whatfield, Ipswich
Jary, Robert M....Rose Hill, Wixoe (Halstead)
Jefferies, John R....Ipswich
Jex, Henry...Aldeby, Beccles
Jillings, John...Little Saxham, Bury St. Edmund's
†Kerrick, John...Geldeston Hall, Beccles
†Kersey, William...Mason's Bridge, Raydon, Hadleigh
King, Walter John...Ipswich
King, W. N....Barton, Bury St. Edmund's
Le Butt, Josiah...Bury St. Edmund's
Lofft, R. E....Troston Hall, Bury St. Edmund's
†Lugar, Henry...Ingham, Bury St. Edmund's
Lungley, Brooke M....Peyton Hall, Boxford
†Mumford, Maurice...Creeting, Stowmarket

Nickerson, George...Barningham, Bury St. Edmund's
Oakes, Hervey A....Stowmarket
†Ogilvie, Alexander...Leiston, Saxmundham
Oldrin, John...Rushmere, Wangford
†Packard, Edward...Ipswich
†Packard, E., jun....Bramford, Ipswich
Paine, George J....Risby, Bury St. Edmund's
Parker, Lt.-Col. Windsor, M.P. ....Clopton Hall, Woolpit
Payne, George E....Badwell Ash, Ixworth
Peto, Lawrence J....17, Esplanade, Lowestoft
†Pettiward, R. J....Finborough Hall, Stowmarket
†Phillips, W. P. T....The Grange, Woodbridge
†Powell, T. Harcourt...Drinkstone Park, Woolpit
Prentice, Eustace C....Woodfield, Stourmarket
†Pretyman, Arthur...Haughley Park, Stowmarket
Ransome, J. E....Bolton Hill, Ipswich
Ransome, Robert C....Ipswich
Read, Henry...London Road, Beccles
†Rendlesham, Lord...Rendlesham Hall, Woodbridge
†Roberts, Oscar W....Debenham
Rodwell, B. B. H..Ampton Hall, Bury St. Edmund's
Rope, Arthur M....Lower Abbey, Catham, Saxmundham
†Sexton, G. Mumford...Wherstead Hall, Ipswich
Shaw, Rev. Morton...Rougham, Bury St. Edmund's
Smith, Alfred J....Rendlesham, Woodbridge
Smith, David...Parham High House, Wickham Market
Smith, John F....Glemsford, Sudbury
South, John...Alton Hall, Stutton, Ipswich
†Steward, A. A....Rise Hall, Akenham, Ipswich
Sturgeon, Joseph...Norton Hall, Woolpit
†Talbot, H...Stanningfield Hall, Bury St. Edmund's
Teverson, Henry...Barnardiston Hall, Haverhill
Thornhill, T., M.P....Packengham Lodge, Bury St. Edmunds
Tinning, John...Chillesford, Wickham Market
Tinning, William...Blue Gates, Ipswich
Toller, James...Blaxhall, Wickham Market
Toller, William...Gedgrave, Wickham Market
Turner, Edward R. T....Ipswich
Turner, Frederick...Ipswich
†Turner, George...Barnham (Thetford)
Turner, J. H....Little Horringer Hall, Bury St. Edmund's
Wallace, Sir R., Bart, M.P....Sudbourne Hall, Wickham Market
Ward, David...Melford, Sudbury
Warner, Edward...Stowmarket
Webb, Lancaster...Combs Tannery, Stowmarket
Wellingham, J....Gedgrave, Wickham Market
Wells, Henry...Occold, Eye
White, Rev. J....Chevington, Bury St. Edmund's
†Whiting, T. C....Barsham House, Beccles
Whitmore, William...Wickham Market
Wigston, Richard....Horsecroft, Bury St. Edmund's
†Wilson, H. Maitland....Stowlangtoft, Bury St. Edmund's
Wilson, William...Baylham Hall, Ipswich
Wolton, H....Newbourn Hall, Woodbridge
†Wolton, S....Butley Abbey, Wickham Market
Woods, E. Freeman...Stowmarket
†Woods, James...Stowmarket
Woodward, Robert...Wetheringsett, Stonham
Wright, Herbert...Ipswich
Youngman, Philip...Walsham-le-Willows, Ixworth

SURREY.

Governors.

†Fuller, Francis...12, Montague Villas, Richmond
Lovelace, Earl of..East Horsley Towers, Woking Stat.

Members.

†Amos, C. E..5, Cedars Rd., Clapham Common, S.W.
†Arnot, James...Woodcote, Carshalton
†Beaumont, J. A....Park House, Wimbledon
Bennett, Rev. H. Leigh...Thorpe, Egham
†Best, J. V...32, Guildford Rd., South Lambeth, S.E.
Bigg, T....Leicester House, Great Dover Street, S.E.
†Birch, George Francis...Clare Park, Farnham
†Blow, W. W....Rydens Road, Walton-on-Thames
Bosanquet, S. Courthope,..Tanhurst, Dorking
Botly, William...Salisbury House, Upper Norwood
†Breach, J. G....Upper Richmond Road, Putney
Briginshaw, William...Bagshot Park
Browse, Henry, sen....The Grange, Red Hill
†Burniston, Richard...The Burkeys, Farnham
Bunyard, Harry....64, Tooley Street, S.E.
†Bushby, H. J....Henleaze, Kingston Hill
Campion, Frederick...Frenches, Red Hill
†Cardwell, E. H....Hill Side, West Horsley
Cattley, William...Northbrook, Godalming
Chadwick, E., C.B....Park Cottage, East Sheen
Clowes, George...Oakhill, Surbiton
Clutton, Henry...Hartswood, Reigate
†Coles, Alfred...Clifton Lodge, Clapham Park
†Colman, Jeremiah...Carshalton Park
Colson, Henry A....Effingham Hill Lodge, Dorking
Cousmaker, Lannoy...Westwood, Guildford
†Crumpage, T....Whitecross Street, Borough, S.E.
Currey, Charles Herbert...Weybridge Heath
Devas, Thomas...Mount Ararat, Wimbledon
†Dowse, W. T....9, St. Thomas Street, London Bridge, S.E.
Drewit, Thomas...Piccard's Farm, Guildford
†Drewitt, William...Lea Farm, Bramley, Guildford
Evershed, Henry...264, Kennington Park Road, S.E.
†Faviell, W. F....Down Place, Guildford
†Field, John L....The Poplars, Addlestone, Weybridge Station
†Forster, Samuel...Southend, Sydenham
Fuller, Robert Willes...Croydon
Gadesden, Augustus W....Ewell Castle
Giles, F. Thresher..Marsh House, Bentley, Farnham
Goodson, William...Hill Farm, Mitcham
†Gossett, Major Arthur...West Park, Mortlake
†Gower, Granville W. G. L....Titsey Park, Godstone
†Grissell, Thomas...Norbury Park, Dorking
Hales, Edward...The Waldrons, Croydon
Hall, Charles...Brickwood Villa, Croydon

Hall, T. Farmer...Effingham, Leatherhead
Harbord, Collet...Cranleigh, Guildford
Healey, E. C....Wyphurst, Guildford
Heath, Admiral Sir Leopold George, K.C.B....Austie Grange, Holmwood
Hepburn, Thomas...Clapham Common
†Hicks, Thomas...Holmewood, Streatham Hill
†Hipwell, G. M....Elmore Lodge, Sutton
†Hodgson, J. Stewart...Denbigh, Haslemere
Hope, T. Radford...Mead Vale, Red Hill
†Hughes, Frederick...Wallfield, Reigate
†Hulse, Charles...Stoke Park, Guildford
Hunter, Lt.-Col...Farquhar Road, Upper Norwood
Hussey, Charles...10, High Street, Croydon
Isham, A. C....Cawood House, Reigate
†Kesterton, Thomas...Sutton
King, Frederick...Holly Lodge, St. John's Hill, Wandsworth
King, Hon. J. P Locke...Woburn Park, Chertsey
†Knight, John H....Weybourne House, Farnham
†Lambert, Henry T....Sandhills, Bletchingley
†Langton, George...2, Northfield Villas, Wandsworth
†Langton, John...Wandsworth
Lascelles, F. H....Mayfield, Rawledge, Farnham
Lees, John...Reigate
†Lefroy, C. J. Maxwell...Crondall, Farnham
Linley, William...Ham Common
Lloyd, Alfred H....Harewood, Bletchingley, Red Hill
Low, S. P....Round Hill, Sydenham
McCullock, David...Galton Park, Reigate
McNiven, Rev. C. M....Perrysfield, Godstone
Madders, G....Grosvenor Terrace, Richmond
Marsdall, Major-General...Broadwater, Godalming
†Martin, E. Waterer...Nonsuch Park Farm, Ewell
†Master, C. Hoskins...Barrow Green House, Godstone
Masterman, T. W....4, Spencer Hill, Wimbledon
†Michell, E. W., jun..Halken, Queen's Rd., Richmond
Moir, J. Gordon...Manor House, Colley, Reigate
†Morris, Norman...Ford, Lingfield
†Murray, A...16, Spencer Terrace, Clapham Junction
Musgrave, Rev. Vernon...Hascombe, Godalming
Newton, John...Manor Road, Bermondsey, S.E.
Northey, E. R....Epsom
Overton, John, jun....Sutton Lodge, Sutton
†Paine, Mrs....Farnham
†Paine, W. Dunkley...Cockshutt Hill, Reigate
Pennington, Frederick, M.P....Broome Hall, Dorking
Pigot, Arthur...West Hall, Byfleet
Pigot, Sir R., Bart...West Hall, Byfleet, Weybridge
Pinckard, G. H....Coombe Court, Godalming
Pochin, H. D....Barn Elms, Barnes
Prout, John...4, Victoria Road, Clapham Common
Puckle, T. B....Woodcote Grove, Carshalton
†Ramsden, J. C....Busbridge Hall, Godalming
Ranford, Charles, New Weston St., Bermondsey, S.E.
Rastrick, George...Woking Lodge, Woking Station
†Rigg, H. A....Wykeham Lodge, Walton-on-Thames
†Roberts, C. Gay...Collards, Haslemere
Robinson, George...Percy Lodge, Walton-on-Thames
†Ross, Owen C. D....Little Bookham, Leatherhead
†Rowcliffe, E. Lee...Cranleigh, Guildford
Sadler, Thomas...Chiddingfold
Sawyer, Henry G....Richmond Park
†Scott, William C....Thorpe, Chertsey
†Shaw, John...Beddington Lodge, Croydon
Simpson, George...Wray Park, Reigate
Stacey, Harry...Merstham, Red Hill
Steere, Lee, M.P....Jayes Park, Dorking
†Stevens, Alfred Henry...Farnham
Still, Henry...Chelsham, Croydon
†Stilwell, J. J. R....Killinghurst, Haslemere
Sutherland, C. Leslie...Coombe, Croydon
†Taber, John...Herne Hill
†Thurlow, T. Lyon...Baynard Park, Guildford
†Trotter, William ... Sydenhurst, Chiddingfold, Godalming
†Trotter, William...Horton Manor, Epsom
Walker, Marmaduke...Addington Lodge, Croydon
Ware, James T....Tilford House, Farnham
Waterer, Anthony...Knapp Hill, Woking
†Watney, John...Distillery House, Wandsworth
†Watney, Norman...Queenswood, Beddington, Croydon
Wetton, Henry...Chertsey
†White, A. Holt...St. Mary's Grove, Richmond
†Wigan, Frederick.. 15, Southwark Street, S.E.
†Wigsell, Captain...Sanderstead Court, Croydon
Wise, Henry...Feltons, Brickham, Reigate
Woolloton, Charles...Elstree, Nutfield
Woolnough, Charles...Ceres Iron Works, Kingston-on-Thames
Woolnough, William...Kingston-on-Thames

SUSSEX.

Governors.

Allison, Arthur...Tilgate Forest Lodge, Crawley
Chichester, Earl of...Stanmore Park, Lewes
Curteis, Major Edward Barrett...Leesam House, Rye
†Freeland, H. W....Chichester
†Leconfield, Lord...Petworth House
Montefiore, Joseph Meyer...Worth Park, Crawley
†Richmond and Gordon, Duke of, K.G....Goodwood Chichester
†Shadwell, Lucas...Fairlight, Hastings

Members.

†Agate, Alfred...Broomhall Farm, Horsham
†Aldridge, Col. J....St. Leonard's Forest, Horsham
Baldwin, W. T....46, Warrior Square, St. Leonards
Bannister, Thomas...Limehurst, Hayward's Heath
Bannister, William...West Dean, Lewes
Barchard, F....Horsted Place, Uckfield
Baring, John...Oakwood, Chichester
Bennett, Sir J...The Banks, Mountfield, Hurst Green
Blackburne, J. T....Bysshe Court, East Grinstead
Blencowe, John George...Binenam, Lewes
Braby, James...Maybanks, Rudgwick, Horsham
Brook, A. Sawyer...Bexhill, Hastings
†Brown, Thomas...Ashdown Forest, Uckfield
†Brydone, H. Gray...Petworth

Caffin, Peter...Hazelwick, Crawley
†Carew-Gibson, G. C... Sandgate Lodge, Pulborough
Case, Thomas H....Streat Place, Hurstpierpoint
Castle, A....The Oaks, Burgess Hill
†Cavendish, Lt.-Col. W. H. F..West Stoke, Chichester
Chasemore, Frederick...Park House, Battle
Cheesman, F. W....Morley, Northiam (Hawkhurst)
†Clay, J. S...Ford Manor, Lingfield, East Grinstead
†Cooper, Charles B....West Worthing Baths
†Coppard, T....Lanehurst Lodge, Hurstpierpoint
Courthorpe, G. C....Whitgh, Hurst Green
Currie, Edmund...West Burton House, Petworth
†Dennett, Mullens...Lodsworth, Petworth
†Dickens, Charles Scrace...Coolhurst, Horsham
†Dickinson, William...Eridge Castle
Dodd, Henry...The Hall, Rotherfield
†Drewitt, Charles J....Drayton, Chichester
†Drewitt, George...Oving, Chichester
†Drewitt, John...North Stoke, Arundel
†Drewitt, John, jun....Patching, Arundel
†Drewitt, R. Dawtrey...Peppering, Arundel
Dudney, Thomas...Hangleton, Shoreham
Duke, George E....Colworth, Chichester
Duke, Lewis W....Blakehurst, Arundel
†Egmont, Earl of...Cowdray Park, Midhurst
Ellis, Charles...Preston House, Beddingham, Lewes
†Ellman, R. H....Berwick Rectory, Lewes
Elwes, H. T....West Hoathley, East Grinstead
Emery, R. Coleman...Hurston Place, Storrington
Fitzhugh, Rev. William...Street, Lewes
†Gates, Richard...7, Sussex Place, Horsham
Gee, Thomas...Dewhurst Lodge, Wadhurst
Gibbons, Sills C....Great Walstead, Lindfield
Gilbey, Walter...Adelaide Mansions, Brighton
†Gorringe, Hugh...Southwick, Shoreham
†Grantham, George...Barcombe Place, Lewes
†Gray, Frederick...Pippinford Park, Uckfield
†Gunter, Richard...Pearcelands, West Hoathley
Hale, Bernard...Holly Hill, Hartfield
Hallett, Major F. F....The Manor House, Brighton
Hampton G....North End, Washington, Pulborough
Harcourt, Colonel F. V....Buxted Park, Uckfield
Hart, Henry P....Beddingham, Lewes
†Hawkshaw, Sir John...Hollycombe (Liphook)
Heasman, Alfred...Calceto, Arundel
Hersee, Miss...Westgate, Chichester
†Hill, Lord Arthur...Wakehurst, Hayward's Heath
†Hubbard, W. Egerton...St. Leonards, Horsham
†Hume, C. Trevor...The Rectory, St. Leonards
Humphrey, Henry...Ashington, Hurstpierpoint
Hussey, Edward...Scotney Castle, Lamberhurst
†Hussey, R. H....29, Brunswick Terrace, Brighton
†Jenner, George...Parsonage House, Udimore, Rye
†Kennedy, William...89, Marine Parade, Brighton
Kent, John...Whyke, Chichester
Knight, Samuel J....Greenfields, Horley, Crawley
Lambe, Robert...East Blatchington, Seaford
Lamming, W. D....Binderton, Chichester
Lawley, Hon. and Rev. Stephen...Lawns Farm, Baynards, Horsham
†Lucas, Herbert T....Warnham Court, Horsham
†Luttman-Johnson, J....Sachel Court, Billingshurst
Lyon, William...Charlwood, Crawley
†Macnaghten, Elliott...Ovingdean, Brighton
†Madgwick, William...Alciston, Lewes
Mannington, C....Morley Farm, Battle
Manningston, W....Laughton Place, Hurst Green
†Mannington, W...The Abbey Farm, Robertsbridge
Marpin, Joseph...Woodlands, Battle
†Margary, Major...Chartham Park, East Grinstead
†Mitford, W. Townley...Pitshill, Petworth
Napper, John...Ifold, Horsham
Nicholls, Rev. H., M.A.. .Hawkhurst Lodge, Billingshurst
†Nottidge, Josias...Iden Rectory, Rye
Oastler, Jonah...Alfold, Horsham
Pappillon, Thomas...Crowhurst Park, Battle
Parlett, W. J....West Dean Farm, Chichester
Peachey, William...Ebernoe, Petworth
†Piper, Edward...Northiam Place, Northiam
†Pipon, Captain...Deerswood, Crawley
†Pratt, Major...Somers, Billingshurst
Pronger, James...Crawley
†Ralkes, G. W...Portslade Cottage, Shoreham
Ratcliffe, R....Standard Hill, Ninfield, Battle
Rigden, William...Ashcroft, Kingston Shoreham
Rosseter, R. M....Manor House, Iford, Lewes
Rowley, Hon. R. T....Ruster Nunnery, Horsham
Sampson, Thomas...Moor Hall, Battle
†Saunders, W. Wilson...Raystead, Worthing
Shroeter, Charles W....Tedfold, Billingshurst
†Simes, N. P....Stood Park, Horsham
Smith, George...Paddockhurst, Crawley
Smith, Martin S....Colwood Park, Hayward's Heath
Speaker, Right Hon. The...Glynde, Lewes
Stanford, Alfred...Eatons, Ashurst, Steyning
Stanford, Edward...Ashurst, Steyning
†Stanford, William...Steyning
Stickney, William...South Stoke, Arundel
St. John, Lieut.-Colonel...Slinfold, Horsham
Tallant, Francis...Easebourne Priory, Midhurst
Tappon, George C. W....Horley, Crawley
Taylor, William...Glynley, Westham
Thompson, T. C....Ashdown Park, East Grinstead
†Tulloch, Wm....Slaughan Park, Crawley
†Turner, Frank...North Bersted, Bognor
Turner, J. Singer...Chyngton Farm, Seaford
Underwood, Michael..Hornshill, Rudgwick, Horsham
†Upperton, Robert...35, Steyne, Brighton
Upton, Henry...Aldwick, Bognor
Verrall, John M....Lower Stoneham, Lewes
Verrall, R. Relfe...Falmer, Lewes
Vickress, Edward...Newbridge Farm, Billingshurst
Vickress, T. A....Hill, Slinfold, Horsham
†Warner, Thomas...47, Sussex Square, Brighton
†Warren, R. A....Preston Place, Arundel
Waters, Benjamin...Motcombe, Eastbourne
Watson, Robert...Standard Hill, Ninfield, Battle
Wilde, S. C....Cheam House, Cheam
Willett, G. W....2, Royal Crescent, Brighton
†Wisden, T. F....Broadwater, Worthing
†Wood, James...Ockley, Hurstpierpoint
Wood, James...Palmers, Billingshurst
Wood, William...Ifield Court, Crawley
Woodbridge, George...Lavant, Chichester
Woolnough, C....Ashdown House, Forest Row

WARWICKSHIRE.

Governors.

Hertford, Marquis of...Ragley Park, Alcester
Howe, Earl...Gopsall, Atherstone
†Leigh, Lord...Stoneleigh Abbey, Kenilworth
†Muntz, G. F....Umberslade Park, Birmingham
†Warwick, Earl of...Warwick Castle

Members.

Abell, Martin...Long Itchington, Rugby
†Adderley, Rt. Hon. C.B., M.P..Hams Hall, Minworth
Addison, John...Hodnell, Southam, Rugby
Adkins, G. C....The Lightwoods, Birmingham
Adkins, Henry...The Firs, Edgbaston, Birmingham
†Allfrey, H.W...Hemingford Ho., Stratford-on-Avon
Arnold, Ralph...Shackerstone, Atherstone
Ashby, Captain G. A....Naseby Woolleys, Rugby
Ashwin, Manley C....Stratford-on-Avon
Aston, F. G....Sheldon, Birmingham
Avery, Samuel, jun....Copt Heath, Solihull, Birmingham
†Avery, W. H..,.Widney Manor, Knowle
Bacon, Samuel...Ratcliffe Culey, Atherstone
Badger, Richard...Surrey House, Leamington
Baker, William...Moor Barns, Atherstone
Barrs, Mrs....Odstone Hall, Atherstone
†Bassett, R. K....Whitley Abbey Farm, Coventry
Bennett, John Ewins...Theddingworth, Rugby
Biggs, Ambrose...Groveley, Birmingham
†Blyth, T. P....The Fields, Southam, Rugby
Boddington, Thomas...Byfield House, Bordesley Green, Birmingham
Bolden, S. E....Bilton Road, Rugby
Bomford, H. B....Exhall Court, Alcester
Bomford, H. J....Dunnington, Alcester
Boultbee, John...Westbrook House, Leamington
Bourne, William...Atherstone
†Brierley, John...Kings Newnham, Rugby
Brierly, Harry...Church Lawford, Rugby
Bromfield, Henry...Flint Hall, Wellesbourne
Bromwich, Thomas...Woolston, Coventry
†Brooks, John..West Heath, Northfield, Birmingham
Burbury, John....Wootton Grange, Kenilworth
Burbury, Joseph H....Montague House, Kenilworth
Burbury, W. P....Croft's Farm, Stratford-on-Avon
†Butler, Hon. C. L....Coton House, Rugby
Caldecott, C. M....Holbrook Grange, Rugby
Canning, George H....Shottery, Stratford on-Avon
Canning, S. H....Sherbourne, Warwick
Cashmore, W. W...Handsworth Wood, Birmingham
†Cave, W. C. B....Smithfield, Birmingham
Chambers, Clifford...Milcote, Stratford-on-Avon
Chase, Robert...Great Barr, Birmingham
†Chattock, H. H....Solihull
Clare, W. Harcourt...Twycross, Atherstone
Cobb, Frederick...Walton, Warwick
Cocks, Charles...Hamstead, Birmingham
†Congreve, S. B....Harbors Magna, Rugby
†Cooper, W. Synge...Hillmorton Paddox, Rugby
Corbett, C....Broad Marston, Stratford-on-Avon
†Couchman, C ...Temple Balsall, Birmingham
Cowper, Robert...Wolverton, Stratford-on-Avon
Crofts, John...Long Lawford Hill, Rugby
†Davis, Francis C....Whichford, Long Compton
Donne, Henry...Leek Woolton, Warwick
†Dormer, Lord...Grove Park, Warwick
†Elkins, William...Elkington, Yelvertoft, Rugby
†Elwell, John...Timberley, Castle Bromwich
Evans, Isaac Pearson...Griff, Nuneaton
†Fardon, H. F....7, Braithwaite Road, Birmingham
Fielding, Henry...Handsworth, Birmingham
†Fisher, H. L...Hilborough, Alcester
Flower, Edward...The Hill, Stratford-on-Avon
†Forrest, Samuel...The Chase, Kenilworth
Fosbury, Captain ..Warwick
Freer, Edward...Wood End, Birmingham
†Galton, Darwin...Claverdon Leys, Warwick
Gardner, John...Twycross, Atherstone
Garner, Charles C....The Wolds, Snitterfield, Stratford-on-Avon
†Gee, John...Welford, Rugby
†German, William...Measham Lodge, Atherstone
†Gibbons, J. S....Halesowen, Birmingham
Gibbs, John...Cutlers Farm, Henley-in-Arden
Gibson, A. L....Temple Row, Birmingham
Gillott, T. L....Broadgate, Coventry
Glover, J. W....Eagle Works, Warwick
†Graham, G....The Oaklands, Yardley, Birmingham
Greenway, G. C....Ashorne Hill, Leamington
†Grimes, W. H....Bubbenhall, Kenilworth
Halbeard, Thomas...Sutton Coldfield
Hamer, Charles M....Snitterfield, Stratford-on-Avon
†Hamilton, Sir R. N. C., Bart., K.C.B....Avon Cliffe, Stratford-on-Avon
†Hammerton, George...Princethorpe, Rugby
Hands, Lawrence...Baginton, Coventry
Hands, Thomas...Canley, Coventry
Harris, James...Fletchamstead, Coventry
Harrison, J. Clarke...Pailton Fields, Rugby
†Harter, J. Collier...The Cedars, Leamington
Hartopp, Sir J., Bt...Four Oaks Hall, Sutton Coldfield
Henniker, Captain...Bulkington, Rugby
Hicken, John...Dunchurch, Rugby
Higgins, Thomas...Lower Binton, Stratford-on-Avon
Hoddell, James...Chapel Fields, Coventry
Hodges, William...Wiidmoor, Stratford-on-Avon
†Hodgson, Arthur...Clopton House, Stratford-on-Avon
Holcroft, Rev. V. O....Oscott, Birmingham
Hopwood, Benjamin D....Birmingham
Howman, Henry A....Hallonghton, Coleshill
†izon, J. B ...Walsgrave-on-Sowe, Coventry
†Jackson, Alfred...Bevington, Alcester
Johnson, T. J....Willoughby, Rugby
Jervis, Hon. E. S....Aston Hall, Sutton Coldfield
†Jones, J. C....Loxley, Warwick
King, John...Rowington, Warwick
Lane, C. P....Moundsley Hall, Kings Norton, Birmingham
Lane, John...Brown Court, Alcester
Lea, Henry...35, Paradise Street, Birmingham
Lea, Richard N....Bennetts Hill, Birmingham
Lees, J. H....Bacons End, Coleshill, Birmingham
Lowe, John.. Moseley, Birmingham

†Lowe, John W....Ettington, Stratford-on-Avon
Luck, Isaac...Highgate Street, Birmingham
†Lunn, Robert...Stratford-on-Avon
†Lythall, F....Radford Hall, Leamington
Lythall, John B....Bingley Hall, Birmingham
McKay, Isaac...Moor Hall Farm, Sutton Coldfield
Malcolm, Matthew...Manor House, Kineton
Mann, John W....Corn Market, Warwick
†Mann, W. R....Greenhill, Harbury, Leamington
Mapplebeck, W. B....Bull Ring, Birmingham
Margetts, John...High Street, Warwick
Mather, Henry...Willoughby, Rugby
†Mather, Myles E....Northumberland Road, Leamington
†Mathews, Jeremiah...Edgbaston, Birmingham
Miller, Rev. G....Ivy Lodge, Radway, Kineton
†Mills, J. Truman...Husband's Bosworth, Rugby
Milne, Oswald, jun....Leamington
Minett, Junius E..Llowley Hall, Fillongley, Coventry
Moore, George...Appleby Hall, Atherstone
Moore, John...Church Street, Warwick
†Morrice, John W....The Tower, Catthorpe, Rugby
†Mott, C. J....Clifton-on-Dunsmore, Rugby
Moxon, T. D....Easenhall, Rugby
†Muntz, Philip A....Birdingbury Hall, Rugby
Nelson, George H....The Lawn, Warwick
Nelson, William...Kenilworth
Newdegate, C. N., M.P....Arbury, Nuneaton
Newton, T. H. G....Barrells Park, Henley-in-Arden
†Norman, John N....Harboro' Magna, Rugby
†Nutt, John...White House, Fillongley, Coventry
Parks, Thomas...Edgbaston, Birmingham
Parsons, C. W....Anstrey, Atherstone
Pennington, Richard...Westfield House, Rugby
Petre, Edward...Whitley Abbey, Coventry
Plant, G. W....Moseley, Birmingham
Potter, R. S....Solihull, Birmingham
Potter, S. B...Witton, Birmingham
Proctor, Alfred B....Coventry
Ratcliffe, T....Norton House, Sheepy, Atherst
Reading, William...Ashorn, Leamington
†Rigg, Joseph...Fillongley, Coventry
†Riley, Luke...Meriden, Coventry
†Robbins, Richard...Kenilworth
†Ryland, H. P....24, Carrs Lane, Birmingham
Ryland, Thomas..Gt. Lister St. Works, Birmingham
Sale, W. H....Arden Hill, Atherstone
Satchwell, Thomas..Hernfield, Knowle, Birmingham
Savidge, John...Appleby, Atherstone
†Scriven, Edward...Wormleighton Hill, Leamington
Senhouse, Captain W....Ashby St. Ledgers, Rugby
†Seymour, Lord Ernest J....Kingley, Alcester
Sharp, Henry...Packington, Coventry
Sheaf, Thomas...Marcliff, Bedford, Warwick
†Slye, W. W....West Haddon, Rugby
Smith, Alfred...Great Barr, Birmingham
Smith, F. D. Lea...Halesowen Grange, Birmingham
Smith, George...Ailston House, Stratford-on-Avon
Smith, Henry...Pinwall Hall, Atherstone
Smith, Henry...The Chestnuts, Leamington
Smith, John...Gorse Farm, Great Barr, Birmingham
Smith, Joseph...Henley-in-Arden
Smith, Richard...Great Barr, Birmingham
Smith, T. H....Atherstone, Stratford-on-Avon
†Smith, W. B....Beauchamp Terrace, Leamington
Spencer, John...Red House, Lillington
Staite, John...Leamington Priory, Warwick
Steedman, George...Hall Green, Birmingham
†Stilgoe, Henry...Lower Clopton, Stratford-on-Avon
†Swinnerton, W. W....Styvechall Grange, Coventry
†Tangye, Richard...Birmingham
Taverner, Joseph W....Shelford House, Nuneaton
†Tempest, Sir C. H., Bart....Ashby Lodge, Rugby
Thomson, T. B....20, High Street, Birmingham
Till, John...Burton Hastings, Nuneaton
Till, William...Barnacle, Coventry
Tipper, B. C....Bristol Road, Birmingham
†Tomes, R. F....Weston, Stratford-on-Avon
†Tomes, W. B....Weston Sands, Stratford-on-Avon
Tommas, Robert...Winson Green, Birmingham
Townshend, Captain H....Caldecote Hall, Nuneaton
Tyler, William...28, Frederick Street, Birmingham
†Tysoe, Samuel...Rumer Hall, Stratford-on-Avon
Villiers, Lady E...Serlby Hall, Husband's Bosworth, Rugby
Wakefield, W. T....Fletchamstead Hall, Coventry
Wallington, George...Little Hill, Wellesbourne
Warner, Thomas...Bulkington, Rugby
Wedge, F. L. W....Knightlow Hill, Rugby
†Welchman, E. W....Oversley Farm, Redditch
†Welchman, F. R....Southam
West, J. R....Alscot Park, Stratford-on-Avon
†Weston, James...Kerseley House, Coventry
Whitmell, J. J....Silsworth Lodge, Rugby
†Winn, John R....Lower Coundy, Coventry
Wise, George...Woodcote, Warwick
Wollaston, Major...Shenton Hall, Nuneaton
Wood, James...Ratcliffe Culey, Atherstone
†Wood, John...Welford, Rugby
Wood, Thomas...Grendon Fields, Atherstone
Wright, John...Fen End, Knowle, Birmingham
Yates, Francis H....Great Barr, Birmingham

WESTMORELAND.

Governor.

Bective, Earl of...Underley Hall, Kirkby Lonsdale

Members.

†Argles, F. Atkinson...Eversley, Milnthorpe
Armitage, V....High House, Kendal
†Arnold, Harry...Arnbarrow, Milnthorpe
Askew, J. W....Ash Meadow, Arnside, Milnthorpe
Atkinson, William...Burneside Hall, Kendal
†Banks, John Jackson...Kendal
†Braithwaite-Wilson, C...Plumtree Hall, Milnthorpe
Browne, George...Troutbeck, Windermere
†Brunskill, Stephen...Sand Area, Kendal
†Burrow, Robert...Wrayton Hall, Kirkby Lonsdale
Close, James...Holmescales, Milnthorpe
Close, Jarvis...Smardale Hall, Kirkby Stephen
Cropper, James...Ellergreen, Kendal
Crosby, John...Breaks Hall, Appleby

Dixon, Thomas...Dalton, Burton
Fell, W. A ...Windermere
Fenton, David Henry...70, Strickland Gate, Kendal
Fulton, A ...Sedgwick, Kendal
†Gandy, Captain H....Castle Bank, Appleby
Gandy, Lieut.-Colonel...Heaves, Milnthorpe
†Gibson, Joseph...Whelprigg, Kirkby Lonsdale
†Handley, William...Greenhead, Milnthorpe
†Harris, Alfred...Lunefield, Kirkby Lonsdale
†Harrison, Daniel...Kendal
†Harrison, John...Nether Levens, Milnthorpe
Harrison, John...Summerlands, Kendal
†Heelis, John A....Garbridge, Appleby
Holme, John...Owlet Ash, Milnthorpe
Johnson, Henry, jun....Kendal
Jones, Frank T....Ambleside
†Keightley, A. D....Old Hall, Milnthorpe
Knight, Richard...Gilthwaiterigg House, Kendal
Long, A. W....Mint Cottage, Kendal
Metcalfe, Anthony...Ravenstonedale, Kirkby Stephen
Milne, Alexander...Lawrence House, Milnthorpe
†Morton, R. C....Lane House, Burton
Nicholson, John...Kirkby Thore Hall
Parker, Rowland...Moss End, Burton
†Punchard, F....Underly, Kirkby Lonsdale
†Redmayne, Giles...Braythay Hall, Ambleside
Rooks, James...High Barns, Milnthorpe
†Shepherd, A....Straw End, Kendal
Sly, Joseph...Waterhead Hotel, Coniston, Ambleside
†Staniforth, Rev. T....Storrs Hall (Windermere)
Stavart, W....Helsington Laiths, Kendal
†Swainson, Joseph, jun....Kendal
Swinglehurst, Henry...Kincaster House, Milnthorpe
Talbot, John...Milnthorpe
Tattersall, William...St. Anthony's, Milnthorpe
Taylor, Richard...New House, Kendal
Thompson, James...Singleton Park, Kendal
†Thompson, William...Moresdale Hall Kendal
Wakefield, W....Birklands, Kendal
†Wakefield, William Henry...Sedgwick, Kendal
Warden, T. Fawcett...Kirkby Lonsdale
Webster, Crayston...Kendal
Whitwell, John, M.P....Bank House, Kendal
†Wilkinson, Coaales...Bank House, Kendal
Williamson, Benjamin...Kendal
†Wilson, C. H....Rigmaden, Kirkby Lonsdale
†Wilson, Christopher W....Oxenholme, Kendal
†Wilson, E. H....Dallam Tower, Milnthorpe
†Wilson, George E....Dallam Tower, Milnthorpe
Wilson, James...Crossthwaite, Milnthorpe

WILTSHIRE.

Governors.

†Bath, Marquis of...Longleat, Warminster
Cowley, Earl...Draycot House, Chippenham
†Morrison, Alfred...Fonthill House, Hindon
Neeld, Sir John, Bart....Grittleton, Chippenham
Radnor, Earl...Longford Castle, Salisbury

Members.

Affleck, William...Swindon
Allen, James D....Tisbury, Salisbury
Andrews, Henry...Little Langford, Heytesbury
†Arkell, Thomas...Pen Hill Farm, Swindon
Attwater, J. Gay...Britford, Salisbury
Bathurst, Lieut.-Col....Clarendon Park, Salisbury
Beaven, James...West Leaze Farm, Swindon
Bolam, C. G....Savernake Forest, Marlborough
Bouverie, Right Hon. E. P....Manor House, Market Lavington
Brown, Charles...Longford Farm, Salisbury
Brown, George...Avebury, Calne
Brown, Henry...Winterbourne Monkton, Swindon
Brown, John M....Manor Farm, Pewsey
Brown, J. Washbourne...Uffcott, Swindon
†Brown, Thomas...Horton, Devizes
Brown, William...Devizes
Brown, W. J....Hazlebury House, Box
Buckwell, Francis...Little Badminton, Chippenham
†Butler, Paul...Down Ampney House, Cricklade
†Butler, William...Badminton, Chippenham
†Canning, W. B....Elston Hill, Devizes
Clark, Isaac...Heddington, Calne
Coles, Robert...Middleton Farm, Warminster
†Colston, C. E....Roundway Park, Devizes
Dangan, Viscount...Draycott House, Chippenham
†Day, William...Woodyates, Salisbury
†Farmer, S. W....Little Bedwyn (Hungerford)
†Ferris, T....Manningford Bohune, Pewsey
†Ferris, W....Manor House, Milton, Pewsey
Finch, W. C....Bemerton Lodge, Salisbury
†Freke, A. D. Hussey...Hannington Hall, Highworth
†Fry, J. C....Oldfield, Marshfield, Chippenham
Goddard, W. Gilbert...Broad Chalk, Salisbury
Graves, Albert R....Charlton House, Ludwell, Salisbury
†Hanbury, Edgar...Eastrop Grange, Highworth
Harding, William...Cranborne, Salisbury
Hatherell, J. C....Oldbury-on-the-Hill, Chippenham
Hayter, Tom John...West Woodgates, Salisbury
Hewer, William...Sevenhampton, Highworth
†Heytesbury, Lord...Heytesbury
Hillier, Douglas...Sherston, Malmesbury
Humby, J. H....Charlton Farm, Salisbury
†Ingram, John A....Wylye, Heytesbury
†Jones, H. P....Portway House, Warminster
Keevil, W. Charles...Teffont Magna, Salisbury
Kemble, Henry...Overton, Swindon
Lane, Ebenezer...Honey Street, Marlborough
†Lansdowne, Marquis of...Bowood, Calne
†Law, Rev. R. V....Christian Malford, Chippenham
Little, Edward...Lan Hill, Chippenham
†Long, Richard P....Rood Ashton, Trowbridge
Lywood, Edwin...Maddington, Devizes
Marshall, H. J....Poulton Priory, Cricklade
May, Charles Neale...Devizes
†Merriman, Edward B....Marlborough
†Merriman, Thomas B....Marlborough
†Merriman, William C....Marlborough
Methuen, Lord...Corsham Court, Chippenhan
Middleditch, E. T....Blandon House, Swindon

†Miles, Charles W....Burton Hill, Malmesbury
Morgan, R. T....Brook House, Cricklade
Parham, James N....Sutton Veney, Warminster
†Parkyns, Sir T. G. A., Bart. ... Harnham Cliff, Salisbury
†Parry, Joseph...Allington, Devizes
†Pembroke, Earl of...Wilton House, Salisbury
Phillimore, E....East Durnley, Gritlleton, Chippenham
Phillips, Sydney H....Bower Chalk, Salisbury
†Phipps, C. P....Chalcot House, Westbury
†Pollen, R. H....Radbourne, Chippenham
Powell, John Thomas...Easton, Pewsey
†Poynder, T. H. A....Hartham Park, Corsham
†Prodgers, Herbert...Kington House, Chippenham
Rawlence, James...Bulbridge, Wilton, Salisbury
Read, James...Salisbury
†Redman, Herbert...East Coulstons, Westbury
Reed, James...Homington, Salisbury
Reeves, Robert...Bratton, Westbury
Ridley, John...Damerham, Salisbury
Rigden, R. H....Salisbury
†Sadler, James H....Purton Court, Purton
Sainsbury, W....Hunt's House, West Lavington, Devizes
†Saunders, T. B....The Priory, Bradford-on-Avon
†Smith, R. Sadler...Durrington, Salisbury
Somerset, John...Milton, Pewsey
Spencer, John...Bowood, Calne
†Spicer, Major...Spye Park, Chippenham
Squarey, Elias P....Downton, Salisbury
†Stanton, Rev. J. J....Tockenham, Wootton Bassett
†Storrar, Robert...Grittleton, Chippenham
†Stratton, Joseph...Alton Priors, Marlborough
Stratton, W....Kingston Deverill, Warminster
Suffolk, Earl of...Charlton Park, Malmesbury
Taunton, William...Redlynch, Salisbury
†Taylor, S. Watson...Erlestoke Park, Westbury
†Thompson, John...Badminton, Chippenham
Williams, Charles...Salisbury
Willis, Joseph D....Bapton, Codford
†Wood, W. Bryan...Branbridge, Chippenham
Wrightson, John...Downton, Salisbury

WORCESTERSHIRE.

Governors.

†Beauchamp, Earl. Madresfield Court, Great Malvern
D'Aumale, H.R.H. the Duke. Wood Norton, Evesham
†Knight, F. Winn, M.P....Wolverley, Kidderminster
Lyttleton, Lord...Hagley Hall, Stourbridge
†Windsor, Lord...Hewel Grange, Bromsgrove

Members.

Allsopp, Henry, M.P....Hindlip Hall, Worcester
Amphlett, John...Clent, Stourbridge
Ashmore, John...Norton, Evesham
†Ashton, T. Henry...Temple Laugherne, Worcester
†Ashwin, W. H....Bretforton Manor, Evesham
Back, John...High Habberley, Kidderminster
†Bailey, Henry James...Rosedale Farm, Tenbury
Baker, William...Riden Farm, Charlton, Pershore
Barker, David Wilson...Mayfield House, Worcester
†Barneby-Lutley, J. H....Brockhampton, Worcester
†Barrows, Colonel...The Birches, Hagley, Stourbridge
Baumgarten, Captain E. P....Netherley, Malvern
†Bearcroft, E....Mere Hall, Droitwich
Best, James, jun....Holt Castle, Worcester
Birchley, Donald A. G...Lea End House, Alvechurch, Redditch
Blakeney, Frank...The Lodge, Chaddesley Corbett, Kidderminster
Blick, John...Hill Court, Droitwich
Bomford, Benjamin...Pitchill, Evesham
†Bomford, Ernest C. G....Spring Hill, Pershore
Boucher, A. E....Wolverley, Kidderminster
†Boulter, Thomas...Shenstone House, Kidderminster
Bramwell, Henry...Crown East Court, Worcester
Brewster, Richard...Heathy Mills, Kidderminster
Briscoe, John...Hill Croome, Severn Stoke
†Brown, W. H....Belbroughton, Stourbridge
†Buck, Albert...Sansome Terrace, Worcester
Buckle, John F....Throckmorton, Pershore
Buckley, James...Hewell Lane Farm, Bromsgrove
Burlingham, Henry...Lansdown, Evesham
Carter, R. H....Fernhill, Cradley, Malvern
Chamberlain, Henry...Bredicot Court, Worcester
Cocks, Robert...Enville, Stourbridge
Cole, J....Bengeworth, Evesham
Coleman, M....Pakenshaw, Headless Cross, Redditch
Comber, Arthur...Kidderminster
Cooke, William H....Skelsley Kings, Worcester
Cookes, John R....Wood Hampton House, Stourport
Corbett, C. H....Admington Hall, Shipston-on-Stour
†Corbett, John...Stoke Works, Bromsgrove
†Corbett, W. A....Dumbleton, Evesham
Coventry, Earl of...Croome Court, Kempsey
Creswell, John...Romsley, Bewdley
Creswell, S., jun....Romsley, Bewdley
†Davies, John J....Grimley, Worcester
†Davis, Peter...Dean Park, Tenbury
Davis, Stephen...Woolashill, Pershore
†Davis, Thomas Henry...Orleton, Tenbury
Dee, J. W....Wilnall, Bewdley
Dorrell, Thomas...Bishampton, Pershore
Dowdeswell, A. C....Pall Court (Tewkesbury)
Dowdeswell, W. E., M.P....Pall Court (Tewkesbury)
Dudfield, Benjamin, jun....Catsley, Kinlet, Bewdley
Dudley, Earl of...Witley Court, Stourport
Dunn, John...Chaddesley Corbett, Kidderminster
†Evans, E. Bickerton...Whitbourne Hall, Worcester
†Firmstone, W. F...Churchill Court, Kidderminster
Gilbert, Joseph...Evesham
†Giles, John...Chaddesley Corbet, Kidderminster
Gough, Ashwin D....Sedgeborrow Hall, Evesham
Green, John...Heath Grange, Worcester
Gresley, Robert A....High Park, Droitwich
Griffin, George...Stone, Kidderminster
Hampton, Lord...Westwood Park, Droitwich

Hancocks, Captain A. T....Wolverley Court, Kidderminster
Hancox, Edward O....Evesham
Harris, Thomas...Stonylane, Bromsgrove
Harward, John...Winterfold, Kidderminster
Haviland, Rev. J....Hartlebury, Kidderminster
Haywood, E. W....Sillins, Redditch
Hemming, Richard...Bentley Manor, Bromsgrove
Herring, Henry...Caldwell Farm, Kidderminster
Hill, John...Severn Stoke, Worcester
†Hill, Thomas R....Catherine Hill House, Worcester
Hollins, Samuel...Sion House, Stourbridge
Holtom, W. F....Cleeve Prior, Evesham
Hopkins, T. M....Lower Wick, Worcester
†Hornyold, J. V...Blackmore Park, Upton-on-Severn
Hudson, A. R....Wick House, Pershore
Humphries, E....Pershore
Hunt, George...Avon View, Evesham
Lakin, Henry...Link End, Malvern
Larkworthy, J. L....Worcester
†Lechmere, Sir E. A. H., Bt....Rhyd Ct., Upton-on-Severn
Lester, Thomas...High Street, Dudley
Lett, William...Rushock, Droitwich
Lilwall, G. H....Brooklands, Fladbury, Pershore
Lloyd, Robert...Offmore, Kidderminster
†Lord, Captain J. P....Hallow Park, Worcester
†Lunn, Joseph...Norton, Evesham
†Lyttelton, Hon. Robert H....Hagley Hall, Stourbridge
Martin, G. E....Ham Court, Upton-on-Severn
Middlemore, Colonel...Thorngrove, Worcester
Middlemore, Mrs....Thorngrove, Worcester
†Midgley, W. H....St. Cuthbert's, Great Malvern
†Moore, Henry...Elmley Castle, Pershore
†Moseley, Captain W. H....Leaton Hall, Stourbridge
†Munn, Frederick...Holt Castle, Worcester
Myatt, James...Offenham, Evesham
†Mynors, R....Weatheroak, Alvechurch, Bromsgrove
Neville, John, jun....Alvechurch, Redditch
Newe, Richard E....Croombe d'Abitot, Kempsey, Worcester
Nightingale, W. R....Bishampton, Pershore
Noel, Captain C. P....Bell Hall, Stourbridge
†Nott, James...Penn Hall, Pardiston, Tenbury
Parker, Rev. W....Little Comberton, Pershore
†Phillips, Sir G.R.,Bt...Weston Ho.,Shipston-on-Stour
Phipps, Thomas...Bricklehampton, Pershore
Pinkett, Thomas P....Bell Hotel, Worcester
Prance, Courtnay C....The Elms, Evesham
Prescott, Mrs....Birches Farm, Tenbury
Purser, Charles...Cradley, Malvern
Randell, Charles...Chadbury, Evesham
Randell, James R....Chadbury, Evesham
Rich, S....Cedars, Fearmale Heath, Worcester
Roberts, A. J....Bretforton, Evesham
Robins, W. S....Dunsley Hall, Stourbridge
Rudge, E. C....Abbey Manor, Evesham
Ryder, T. B....Bransford, Worcester
Savory, A. H....Aldington Manor, Evesham
†Sheldon, H. J....Brailes House, Shipston-on-Stour
Smith, Henry William...Evesham
Smith, R. Vassar...Ashfield, Great Malvern
Smith, William...Bridge Street, Evesham
†Smith, William...Fladbury, Pershore
Smithin, Benjamin...Dumbleton, Evesham
†Southall, Thomas...Worcester
Stallard, William...Ivy Bank, Worcester
Stamford and Warrington, Earl of...Enville House, Stourbridge
Stephens, George...Fladbury, Pershore
Stokes, Henry...Laverton Meadow, Broadway
Strickland, George...Wyke Cottage, West Malvern
Tearne, R. T. P....Hallow Park Farm, Worcester
Trinder, T....Cradley, Malvern
†Vernon Harry Foley...Hanbury Hall, Droitwich
Walker, G. I. Alexander...Norton, Worcester
Walker, John S....Knightwick, Worcester
Wall, Thomas...The Ford Farm, Droitwich
Walmesley, V. O....Wolverton, Pershore
†Walton, H. L....Burmington, Shipston-on-Stour
Warmington, C....Granville Hall, Hinton, Evesham
†Watkins, J. G....Woodfield, Ombersley, Worcester
†Watson, John...Waresley, Kidderminster
Webb, Edward...Wordsley, Stourbridge
Webb, Frederick Pace...Evesham
Webb, Henry...Sansome Lodge, Worcester
Webb, William...Worcester
Webb, William G....Wordsley, Stourbridge
†Wheeler, E. V....Kyrewood House, Tenbury
Wheeler, W....Long Compton, Shipston-on-Stour
Whitford, Richard...Avon Side, Evesham
†Wilson, John Wilson...Broadway, Evesham
Woodward, R....Ardley Castle, Bewdley
Workman, J. B....Upton-on-Severn

YORKSHIRE.

Governors.

†Aldham, William...Frickley Hall, Doncaster
†Cathcart, Earl...Thornton-le-Street, Thirsk
†Childers, John W....Cantley Hall, Doncaster
†Dent, John D....Ribston Hall, Wetherby
Feversham, Earl of...Duncombe Park, Helmsley
Fitzwilliam, Earl, K.G....Wentworth, Rotherham
†Harewood, Earl of...Harewood House, Leeds
Johnstone, Sir H., Bt., M.P..Hackness Hall, Scarboro'
Middleton, Lord...Settrington House
Ripon, Marquis of...Studley Royal, Ripon
Stourton, Lord...Stourton, Knaresborough

Members.

Akenhead, R....Otterington Hall, Northallerton
†Akroyd, Edward...Bank Field, Halifax
Angas, George...Beeford Grange, Hull
Archer, James...The Castle, Sledmere, York
Ashforth, Joseph...Sheffield
†Ashton, R. H....Castletown, Sheffield
†Atchison, William...Bowling Works, Bradford
†Athorpe, J. C....Dinnington Hall, Rotherham
†Auckland, Lord...Doncaster
Bagshawe, F. W....The Oaks, Sheffield
Bamlett, A. C....Thirsk
†Barber, Thomas...Sproatley Rise, Hull

Barnard, C. E. G....Cave Castle, Brough
†Barstow, C. D....Garrow Hill, York
†Barton, J. Hope...Stapleton Park, Pontefract
Bartram, William...Harrogate
Baxter, Benjamin...Elslack Hall, Skipton
Baxter, Robert...Doncaster
Beachel, John...Rawcliffe, Selby
Beckitt, Richard...Watton Abbey, Driffield
Bethell, William...Rise, Beverley
†Bolton, Lord...Bolton Hall, Bedale
Booth, John B....Killerby, Catterick
Borton, Hebden...Barton-le-Street, Malton
Botterill, Richard...Wauldby, Brough
Bower, E. C....Wadworth Hall, Doncaster
Bower, R. H....Welham Hall, Malton
†Boynton, T....Ulrome Cottage, Lowthorpe, Hull
Bramley, Robert...Airmyn, Howden
†Briggs, Rawdon...Birstwith Hall, Ripley
Broadley, W. H. H., M.P....Welton Hall, Brough
†Brogden, Robert...Great Ouseburn, York
†Bromet, William R....Cocksford, Tadcaster
†Brook, John A....Fenay Hall, Huddersfield
†Brooke, William...Northgate House, Huddersfield
†Broomhead, B. P....Broomhall Park, Sheffield
Broughton, C. J. E....Wortley, Sheffield
†Brown, Douglas...Ancliffe Hall, Northallerton
Brown, E....Bilborough Lodge, York
Brown, William...Holme-on-Spalding Moor, York
Bruce, Robert...Great Smeaton, Northallerton
Bushell, Henry...Skeldergate, York
Butterworth, George...Airmyn, Howden
†Cadle, Miles...Nelson Terrace, Coatham, Redcar
Campbell, H....Owston Grange, Rotherham
Cathcart, Col. the Hon. A....Spennithorne, Bedale
Cattle, James...Warter, Pocklington
Cayley, Sir Digby, Bart....Brompton, York
Cayley, Edward S....Wydale, York
Chaloner, Admiral...Longhull, Guisborough
†Chambers, B. E. C....High Green House, Sheffield
Champneys, Rev. T. P....Badsworth, Pontefract
Charlesworth, C. E....Moor House, Stanley, Wakefield
†Charlesworth, John...Middlestown, Wakefield
†Charlesworth, J. Barff...Hatfield Hall, Wakefield
†Charlesworth, Joseph...Lofthouse
Charlton, Thomas...Middlesborough
†Cholmley, H. W....Newton Hall, Rillington
†Clarke, Frederick J. P....North Ferriby, Hull
Clarke, John W....Guisborough
†Clay, Charles...Walton Grange, Wakefield
Clayton, T. Greenwood...Ousecliff, York
Cleasby, Thomas M....Wilton Grange, Redcar
†Clutton, William James...The Mount, York
†Cochrane, A. H....Aldwark Manor, Easingwold
†Cocking, W. F....Crowle, Doncaster
Coleman, John...Riccal Hall, York
Collison, William...Beverley
†Comber, Thomas...Redcliffe, Newton-le-Willows
†Connell, Thomas...Sunk Island, Hull
Cook, Edward J....Kingston-upon-Hull
†Cooke, Philip B. D....Owston Hall, Doncaster
Copeland, Stephenson...Beverley
Corner, Edward...Esk Hall, Whitby
Coulman, John...Red House, Thorne
†Crathorne, James S....St. Mary's Chambers, H
†Crawhall, George...Burton Croft, York
†Creyke, Ralph...Rawcliffe Hall, Selby
†Croft, A. H....Aldborough Hall, Boroughbridge
†Crosskill, Alfred...Beverley
†Crowther, J. F....Knowle Grove, Mirfield
Crust, Joseph...Catwick, Skirlaugh, Hull
Cundy, T. Tyson...Hall Orchards, Wetherby
Cuthbert, Robert...North Tanfield, Bedale
†Dalton, George...Soho Foundry, Leeds
Dalton, John...Sleningford Park, Ripon
Danby, F....Kirbygrindalyth, York
Darley, Charles A....Burtonfield, Stamfordbridge
†Darley, Henry...Aldby Park, York
Darley, Mrs....Barmoor, Kirby Moorside
Darrell, Thomas...Spickers Hall, West Ayton, York
†Darwin, Francis...Creskeld Hall, Otley
Davison, Richard...Driffield
Dawson, George...Thorncliffe, Sheffield
Deane, Patrick...High Street, Hull
Denison, W. Beckett, M.P....Noo Appleton, Todcaster
Dudding, Thomas...Fockerby, Goole
Dunn, Jonathan...Kelfield Lodge, York
Dunn, R. L....Hatfield Parva, Skirlaugh
Durham, Makin...Thorne
Dyke, Francis Hart...3, Museum Street, York
Dymond, Thomas...Burntwood Hall, Barnsley
†Eddison, R. W....Headingley Hill, Leeds
†Eddison, William...Huddersfield
Edwards, Sir H., Bart....Pye Nest, Halifax
Elston, William...Bank House, Selby
Evennett, Thomas...Tent Cottage, Coniston
Fairley, Thomas...16, East Parade, Leeds
†Farrer, H. R....Green Hammerton
Farrer, J....Ingleborough (Lancaster)
†Fawkes, Ayscough...Farnley Hall, Otley
Fisher, Edward...New Walk, Beverley
Fisher, Robert, jun....Leconfield, Beverley
Fisken, T. R. H....Dewsbury Road, Leeds
Ford, John...Tancred, Whixley, York
Foster, John...Fockerby, Goole
Foster, L., jun....88, Warmgate, York
†Fox, G. Lane...Bramham Park, Tadcaster
Francis, G. C....Saltaugh Grange, Keyingham, Hull
†Francis, G. L....Saltaugh Grange, Keyingham, Hull
†Frank, F. Bacon...Campsall Hall, Doncaster
Freeman, Joseph...Keyingham
Garnett, J....Rawdon Hill, Harewood, Leeds
Gascoyne, F. C. T....Padlington, South Milford
Gauntlett, W. Henry...Middlesboro'-on-Tees
Gilpin-Brown, George...Sodbury Park, Richmond
Glew, James...Prickett Hill, Howden
Glossop, W. H....Wood Laiths, Rotherham
Golden, William...Huddersfield
Gothorp, James...Mowbray Hill, Bedale
Gouthwaite, Richard...Lumby, South Milford
Greaves, John...Thurlstone, Penistone
Green, Robert...Scalby, Scarborough
†Greenwood, F. B....Swarcliffe Hall, Ripley
†Greig, David...Leeds
†Gunter, Colonel R....Wetherby

Haggard, William...Rotherham
†Halifax, Viscount...Hickleton Hall, Doncaster
†Hall, Charles E....Savile St. East, Sheffield
Hall, J. F....Norbury, Pitsmoor, Sheffield
Handley, Frederick...St. Mary's, York
†Hardacre, Richard...Hellifield, Leeds
†Harland, H. Seaton...Brompton, York
Harrison, Jonathan, jun....Brandesburton, Hull
†Haworth-Booth, Lieut.-Colonel...Derwent Park, Malton
Hebblethwaite, Thomas F....Hull
†Herries, Lord...Everingham Park, Pocklington
Hewson, Frederick...The Haven Farm, Tickhill
Highmoor, J. R....Enderby, Queenhow, Thirsk
†Hildyard, J. G. B. Thoroton..Winestead Hall, Hull
†Hildyard, J. R. W.....Hutton Honville Hall, Northallerton
†Hincks, Captain T. C....Breckenborough, Thirsk
Holroyd-Bradbury, G. E....Brighouse
Hornby, Thomas...West Flotmanby, Ganton
Horne, W. Pybus...Moulton, Richmond
†Hotham, Lord...Dalton Hall, Hull
Hunt, Wm....Lorne Villa, Eldon Grove, Hull
Hutchinson, T. H....Manor House, Catterick
Hutchinson, William...Gunby, Selby
†Hutton, John...Solberge, Northallerton
Ingham, S. H....Marr, Doncaster
Ingilby, Sir H. D., Bart....Ripley Castle, Ripley
†Jaques, Leonard...Wentbridge House, Pontefract
Jaques, T. G....Blacktoft, Howd n
†Jefferson, Jos. J. Dunnington..Thicket Priory, York
Johnson, Botterill...Frodingham Bridge, Hull
†Johnstone, J. C. Hirst...Manston House, Leeds
Jordan, J. Staveley...North Dalton, Hull
Kay, Richard...Scorton, Catterick
†Kaye, J. E....Bretton Park, Wakefield
Kearsley, George...Prospect House, Ripon
†Kirk, Richard...Gale Bank, Wensleydale
Kitson, James...Elmcote Hall, Leeds
†Knowles, James...Middlestown Farm, Wakefield
†Lambert, C....Sunk Island, Otteringham, Hull
Lancaster, George...Moreton Grange, Northallerton
†Lascelles, Hon. G. E....Sion Hill, Thirsk
Laverack, S. S....Redness Hall, Goole
†Lawson, Sir John, Bart....Brough Hall, Catterick
Laycock, W....Woodville, Keighley
Leatham, Gerald A. B....Thorganby Hall, York
Leatham, W. H....Hemsworth Hall, Pontefract
Leather, J. T....Leventhorpe Hall, Leeds
Lee, Charles...Grewthorpe, Ripon
Legard, Digby C....Clifton, York
Legard, Sir C., Bart., M.P....Ganton Hall, York
Lewthwaite, George...Littlebank, Settle
Linton, William...Sheriff Hutton, York
Lister, George...Cottingham, Hull
†Londesborough, Lord...Market Weighton
Lowe, Robert...Shire Green, Sheffield
†Lupton, Arthur...Headingley, Leeds
Machin, Richard...Skewkirk Farm, Green Hammerton
†McLaren, John ..Midland Works, Leeds
Mangles, George...Givendale Grange, Ripon
Markham, Lt.-Col. W. T..Becca Hall, Milford Junction
†Marrian, Thomas, jun.... Thurcroft, Mateby, Rotherham
†Marshall, Arthur...Headingley, Leeds
†Marshall, G. H....Enholmes, Patrington, Hull
†Marshall, J. Garth...Headingley, Leeds
Marshall, James W....Blanch Farm, Pocklington
Matthews, Francis Cooke...Driffield
Mellows, William...High Melton, Doncaster
†Meysey-Thompson, Sir H. M., Bart....Kirby Hall, York
Michell, John...Forcett Park (Darlington)
Milbank, Powlett C....Thorpe Perrow, Bedale
Mills, R. W. F....Lendal, York
Moiser, H. R....Heworth Grange, York
Moore, W. C....Bamford, Sheffield
†Moorsom, C. R....Harewood, Leeds
†Morrison, Walter...Malham Tarn, Skipton
Moscrop, W. J....Olliver, Richmond
Mosey, William...Kiveton Park, Sheffield
Nicholson, Thomas....100, Lowther Street, York
Norfolk, Richard...Beverley
†Normanby, Marquis of...Mulgrave Castle, Whitby
Nowell, W. Atkinson....Linton House, Skipton
†Orde-Powlett, Hon. W. T....Wensley Hall, Bedale
Outhwaite, John...Bainesse, Catterick
Owen, William...Rotherham
Pardey, James E....Newton-le-Willows
Parker, T. J....North Church Street, Sheffield
†Parr, W. F....3, Stonegate, York
†Parsons, Edward...Birdsall, York
†Paver, William...Peckfield, Milford Junction
†Paver-Crow, R....Ornham Hall, Boroughbridge
†Phillips, J. H....22, Albemarle Crescent, Scarboro'
†Pilkington, Sir L. M. S., Bart...Chevet Pk., Wakefield
†Powell, Rev. S. H....Sharon Hall, Ripon
†Preston, Captain J. N....Flasby Hall, Gargrave-in-Craven
Preston, T....Scosthrop House, Bell Busk, Leeds
Preston, Thomas H....Moreby Hall, York
†Pulleine, Henry...Baxter Hall, Selby
†Pulleine, James...Clifton Castle, Bedale
†Ramsden, Sir J. W., Bart....Byram, Ferrybridge
†Reynard, M. M....Sunderlandwick, Driffield
Richardson, G....Bridlington Quay
Richardson, H....Cherry Hill, York
†Richardson, R....The Grange, Skirlaugh, Hull
†Riley, Edmond...Kipling Cotes Farm, Market Weighton
Robinson, James...Hook, Howden
†Robinson, T....Nuthill, Hedon, Hull
†Robson, Thomas...Cundall Lodge, Boroughbridge
†Rockett, John H....Snaith Hall, Snaith
Rollett, Richard...Thorne
Rounding, Thomas...Fraisthorpe, Bridlington
†St. Leger, Colonel...Park Hill, Rotherham
Saltmarshe, Philip...Saltmarshe, Howden
Sampson, G., jun....Beauchieff Abbey, Sheffield
Sanday, G. H....Wensley House, Bedale
Satterthwaite, T. E. S....Castle Howard
†Senior, Guy...Beevor Hall, Barnsley
Shann, Charles...Inholes, Tadcaster
Sharp, Isaac...Middlesborough-on-Tees
Singleton, J. R....Great Givendale, Pocklington

Slingsby, Thomas...Scriven Park, Knaresborough
Smith, G. B....11, Melbourne Place, Bradford
†Smith, Henry F....Lamwath House, Sutton, Hull
Smith, Jacob...Humberton, Helperby
†Smith, J. Metcalf...Leeds
Smith, Robert...Ardwick-le-Street, Malton
Smith, William...Goole Grange, Goole
Smurthwaite, Thomas...Bootham Terrace, York
Sorby, Horatio...Aughton, Rotherham
Stamper, T....Highfield House, Oswaldkirk, York
†Standering, William...Selby
†Stanhope, W. T. W. Spencer, M.P....Cannon Hall, Barnsley
†Stapylton, Major...Myton Hall, Boroughbridge
Staveley, John...Southburn, Driffield
Staveley, Simpson...Tibthorpe Manor, Driffield
†Stephenson, Marshall...Helmsley, York
Stevenson, Peter...Rainton, Thirsk
†Stickney, Walter M....Danthorpe Hall, Hull
Story, John T....Hooton Roberts, Rotherham
Stott, Miss...Pool House, Otley
†Stourton, Henry...Holme Hall, York
†Strickland, C. W....Hildenley, Malton
Suffield, Thomas...Tanfield House, Bedale
†Swann, Robert...Askham Hall, York
†Sykes, C., M.P....Brantingham Thorpe, Brough
Talbot, George T....Wentworth, Rotherham
Taylor, F. Howard...Middlewood Hall, Barnsley
†Taylor, G. E....Langthorpe House, Boroughbridge
Tempest, Colonel...Tong Hall, Leeds
†Tennant, Robert...Scarcroft Lodge, Leeds
Tennant, Thomas...Blenheim Terrace, Leeds
†Thompson, Joseph...Anlaby, Hull
†Tiffen, Joseph...Minster Corner, Beverley
Tinker, Henry...1, New Street, Huddersfield
Tomlinson-Walker, William...York
Topham, Wm....Kirkburn Manor, Driffield
Toulson, John Parker...Skipworth Hall, Selby
Townend, Edward...The Nook, Bingley, York
Tweedie, R....The Forest, Catterick
Tyson, I. O....Ousegate Works, Selby
†Vyner, H. F. Clare...Newby Hall, Ripon
Waistell, William...Barnard Castle
Walker, Benjamin...Haya Park, Knaresborough
†Walker, F. James...Claxton Grange, York
†Walker, Horace...Osgathorpe, Sheffield
Walker, James R....Ganton Hall, York
Walker, John...Mount St John, Thirsk
Walker, Joseph...The Poplars, Knaresborough
Walker, Thomas...The Woodlands, Doncaster
Walmsley, G....Rudston House, Bridlington
†Waterhouse, J. T....Braithwell Manor, Rotherham
Waterhouse, Samuel, M.P....Halifax
Watson, T....Holderness Hotel, Beverley
†Welby, E. M. Earle...Norton Leas, Sheffield
Wells, Arthur J....Hatfield, Doncaster
†Wenlock, Lord...Escrick Park, York
Wentworth, Godfrey H....Woolley Park, Wakefield
Wharton, G. Livingstone...Grove Hill, Beverley
†Wharton, J. T....Skelton Castle, Guisborough
Wheatley, F....Kimberworth Park, Rotherham
Wheatley, John...Water Priory, Pocklington
Whitaker, B. Ingham...Hesley Hall, Rotherham
White, John...Wilsirk, Doncaster
Wickham, L. W....Chestnut Grove, Tadcaster
†Williamson, W. E....Catterick
Willis, Thomas...Manor House, Carperby, Bedale
Wilmot, R. C....Woolley Park Farm, Wakefield
†Wilson, John...Seacroft Hall, Leeds
Wilson, Matthew...Eshton Hall, Gargrave, Leeds
Wilson, M. W....Eshton Hall, Gargrave
†Wombwell, Sir G. Bart....Newburgh, Easingwold
Wood, John...8, The Cresent, Ripon
Wood, Richard...Potternewton, Leeds
Woodd, Basil T., M.P....Conyngham Hall, Knaresborough
†Woodyear, Rev. J. F. W....Crookhill, Doncaster
†Worsley, Major W. Cayley...Hovingham, York
Wray, John...Leeming Bar, Bedale
†Wright, George...North Anston, Rotherham
Wright, Sir William...Siggleshorne, Holderness
†Wrightson, W. B....Cusworth Park, Doncaster
†Wyse, Robert...Auburn Hill, Malton
Yates, Thomas...Doncaster
†Yeoman, R. C...Marsk Hall, Marsk-by-the-Sea
Yorke, E. C....Hutton Hall, York
†Yorke, John...Beverley Hall, Pateley Bridge
†Yorke, T. E....Halton Place, Hellifield, Leeds
Yorkshire Agricultural Society, Secretary of
†Zetland, Earl of...Aske Hall, Richmond

CHANNEL ISLANDS.

Members.

Boyd-Kinnear, John...Courtil, Rozel, Guernsey
James, J....Les Vauxbelets, Guernsey
Jones, Wm. M....St. Peter's Port, Guernsey
Le Cornu, Lieut.-Col....La Hague Manor, Jersey
Le Gallais, Albert...La Moire House, Jersey
Lempriere, Rev. W....Rozel Manor, Jersey
Maindonald, T....St. Peters Port, Guernsey
†Turner, Lieut.-Colonel F. H....Gouray, Jersey
Watson, Rev. Joshua R....La Favorita, Guernsey

NORTH WALES.

Governors.

Penrhyn, Lord...Penrhyn Castle, Bangor
†Powis, Earl of...Powis Castle, Welshpool
Wynn, Sir W. W. Bt., M.P....Wynnstay, Ruabon

Members.

Baguley, Clement...The Oldfields, Pulford, Wrexham
†Bankes, J. Scott...Soughton Hall, Northop
†Barnes, J. R....Brookside, Chirk
†Barnes, Thomas...The Quinta, Chirk
†Bate, Thomas...Kelsterton Hall, Flints
Bell, William...Bodrhyddan, Rhuddlan, Rhyl

†Best, Captain J. C....Plas-yn-Vivod, Llangollen
Biddulph, R. Middleton...Chirk Castle
Blezard, Robert...Pool Park, Ruthin
Bowdage, Thomas W....Tyddyn-y-groynt, Mold
†Bowman, J. B....Sandycroft Farm, Hawarden
Brooke, Major-General...Mount Severn, Llanidloes
Broughton, E. W. D....Bryn Elwy, St. Asaph
Buddicom, W. B....Penbedu Hall, Mold
†Burton, John...Gresford, Wrexham
†Burton, Oliver...Gwaynynog, Denbigh
Carr, John...New Marton, Chirk
Chambres, P. H....Llysmeirchion, Trefnant, Rhyl
Chapman, Richard H....St. Asaph
†Charlton, St. John...Pentreffynon, Holywell
Chidlow, A....Cloy Hall, Bangor, Wrexham
†Conwy, Major Rowley...Bodrhyddan, Rhyl
Cooke, Lt.-Col. B. G. D....Colomendy, Mold
Cotton, F. E....Lower Farm, Ruabon
Crewe-Read, Capt., R.N....Llandinam Hall, Montgomery
Darbishire, S. D....Pendyffryn, Conway
†Darby, Abraham...Treberfydd, Brecon
Darlington, James...Black Park, Chirk
Davies, James...Jamesford, Montgomery
Davies, Moses...Llanfyllin
Dawson, John...Gronant, Rhyl
Dennis, Henry...Hafod-y-bwch, Ruabon
Denson, Samuel...Pwllhalog Hall, Rhyl
†Dod, Whitehall...Llannerch, St. Asaph
†Doyle, John A....Plâs Dulas, Abergele
Edleston, Ralph F....Rhydorddwy fawr, Rhyl
Edwards, E....Cambrian Villa, Newton
Edwards, G....Trevor House, Ruabon
Edwards, W....The Brewery, Ruthin
†Elwell, E....Nenaddfraith, Newtown
Evans, John...Abernant, Llanwrtyd, Brecon
Evans, J. S. H....Veryd Lodge, Rhyl
Evans, W. P....Greenfield, Trefnant, Rhyl
†Eyton, Adam...Plas Llanerch y mor, Holywell
Eyton, T. Wynne...The Tower, Mold
Fairles Humphreys, N. W.....Bank House, Montgomery
Farmer, George...Montgomery
Farmer, James U....Llyssum, Welshpool
†Fitzhugh, Thomas Lloyd...Plâs Power, Wrexham
†Fortune, W....Newtown, Montgomery
†Gillart, Richard...Llynllvedd, Machynlleth
†Green, Edward...The Moors, Welshpool
Griffiths, Elias...Chirk, Ruabon
Griffiths, William...Chirk
†Haig, A. W....Pen Ithon, Newtown
†Haig, G. A....Pen Ithon, Newtown
Hare, T. W....Berthddu, Llandinam
Heyward, Colonel...Crosswood, Welshpool
Hill-Trevor, Lord A. E., M.P....Brynkinalt, Chirk
Hodgson, I. Scott...Sodylt Hall, Ruabon
†Howard, Robert...Broughton Hall, Wrexham
Howell, Leigh...Bagillt Foundry, Flints
Hughes, Edward...St. Martins, Chirk, Ruabon
†Hughes, H. R....Kinmel Park, St. Asaph
Hughes, H. R....Ystrad, Denbigh
Hughes, Owen...Bodycetyn, Ruabon
Hughes, P. G....Cwm Earl, Kerry, Newtown
Hughes, William...Llanerchymedd, Anglesey
Hughes, W. C....Fennant, Ruabon
†Humberston, P. S....Glan-y-Wern, Denbigh
†Humphreys-Owen, Arthur C....Glansevern, Garthmyl
Iken, Alfred...Cefn Gwifer, Newtown
Issard, Thomas E....High Street, Newtown
James, Richard...Dyffryn Awr, Llanrwst
Jeffreys, Robert...Min-avon, Colwyn, Carnarvon
Jesse, John F....Llanbedr Hall, Ruthin
John, David...High Street, Llanfair
Jones, Lt.-Col. A. S., V.C...Hafod-y-Wern, Wrexham
Jones, C. Pryce...Cwmberllan House, Newtown
Jones, Edward...Park Farm, Caersws
Jones, Edward...Parkgate Farm, Northop, Flints
Jones, Griffith...Wrexham Street, Mold
Jones, John...Green Walls, Dodleston, Wrexham
Jones, John...Nautcribba, Welshpool
Jones, R. E....Cefn-Bryntalch, Abermule
Jones, Robert L....St. Asaph
Jones, Thomas...Rhyd-y-cilgwyn, Ruthin
Jones, Thomas...Hendregadog, Gaerwen, Anglesea
†Jones, Walter B. C.... Mynydd, Ednyfod, Criccith, Carnarvon
Jones, William...Blackhall, Newtown
Kerfoot, James...Hendre Back, Abergele
Kerfoot, John...Faenol Back, St. Asaph
Kerfoot, R....Bodhafod, Abergele
Kinsey, Timothy...Kerry, Newtown
Kirkby, D. E....Llanfendigaid, Towyn
Kyrke, R. V....Nantyffrith Hall, Wrexham
Langford, Thomas,...Keel Castle, Berriew
Lee, John...Bangor Iscoed, Wrexham
Lewis, John...Great Western Farm, Montgomery
Lewis, Thomas L. H....Bodwr, Holyhead
Lloyd, Edward...Tyntwell, Llanfyllid, Mont
Lloyd, Joseph...St. Asaph
†Lloyd, Llewellyn...Croesnewydd, Wrexham
Lloyd, Richard, jun....Broad Street, Newtown
Lynch, Joseph...Glascoed Hall, Wrexham
Mainwaring, Charles S....Galltfaenan, Rhyl
†Mainwaring, Townshend...Galltfaenan, Denbigh
Meridith, John...Puckley Farm, Montgomery
Miller, Samuel...The Court, Abermule
Milligan, John...Burrashead, Gresford, Wrexham
Moore, Lawton L....Glanmehely, Kerry, Newtown
Morgan, C....High Street, Newtown
Morgan, H....Cefnairy, Newtown
Morgan, Richard...Bahaillon, Newtown
Morgan, Samuel, jun....Newtown
Morris, Edward...Gwernygoe, Tarn, Newtown
Morris, E. R....Homestay, Newtown
Morris, Robert...Hendref, Rhuddlan
†Morris, Thomas...Henfaes, Welshpool
Mostyn, Sir Pyers, Bart....Talacre, Holywell
†Mytton, D. Herbert...Garth, Welshpool
†Naylor, John...Leighton Hall, Welshpool
Newell, Evan...Escuan Hall, Towyn
†Oakeley, William E....The Plas, Tan-y-bwlch
†Ormrod, Peter...Pen-y-lan, Ruabon
Ormston, John...Wigfair, St. Asaph
Owen, Griffith H...Ymlch, Carn Dolbenman, R.S.O.
Owen, William...Hendre Vaur, Abergele

†Palmer, Sir Roger W., Bart...Cefn Park, Wrexham
†Park, Thomas...Cremlyn, Beaumaris
Parmeter, Francis, jun....Brynyraber, Bala
Parry, Thomas...Faenol-fawr, St. Asaph
Parry, Thomas R....Holt Lodge, Wrexham
Peel, Edmund...Bryn-y-Pys, Wrexham
Peers, Joseph...Ruthin
†Pennant, P. Pennant...Brynbella, St. Asaph
†Philips, Captain E. W....Rhual, Mold
Pickering, William...Poulton, Pulford, Wrexham
Pickstone, William...Maesmynam Hall, Holywell
Platt, Major H....Gorddinog, Bangor
Podmore, Robert...Sealand, Queen's Ferry, Flint
Powell, Evan...Broomcliffe, Llanidloes
Powell, James...Butlington Hall, Welshpool
†Price, R. J. Lloyd...Rhiwlas, Bala
Prichard, T....Llwydairtb, Esgob, Llanerchymedd
Pryce, Edward...The Henfron, Montgomery
Pryce, George...Pennygelly, Kerry, Newtown
†Pryce, John...Cwmyrhirwdre, Dolver
Pryce, Thomas...Scafell, Newtown
†Pugh, Maurice R....Cefn Campbell, Towyn
Rayner, G. P....Llanddyfnan, Llangefni
Richards, G. F....Green Hall, Llanfyllin
Roberts, B. S....Burton Hall, Wrexham
Roberts, F. L....Queen's Ferry, Flint
Roberts, John...Geinas House, Bodfair, Rhyl
Roddick, Thomas...Penbedu Uchof, Mold
Rogers, E....White Rock, Llanymynech
Rowland, W....Royal Oak Hotel, Welshpool
Ruck, Lawrence...Pantilludw, Machynlleth
Ryle, John...Penllwn, Llanfyllin
†Sandbach, H. R....Hafodunos, Abergele
Sheriff, A. T. A....Crogen, Corwen
†Sisson, Robert J....Talardy, St. Asaph
Smith, R. Barclay...Tyncwydd, Bangor
Somerville, James...Chirk Castle, Ruabon
Spicer, Henry...Ewloe Bain Farm, Mold
Sutton, Ambrose...Althrey, Wrexham
Sykes, John...Croes Howell, Wrexham
†Tatton, Thomas E....Cefn-y-wern, Ruabon
Thomas, Edward...Penisarwaen, Trefnant, Rhyl
Thomas, L. H....Caerffynnon, Talsarna, Caernarvon
Trethewy, A. H....Rhyd-y-crena, Llanrwst
Turner, William...Newtown
Vaughan, L. E....Trederwen Hall, Llanymynech
†Verney, Comm., R.N....Rhianva, Menai Bridge
Watkins, Evan...Bank Place, Llanfyllin
†Willett, Richard...Lower Leighton, Welshpool
Williams, David...Byshtin Marsh Farm, Mostyn
Williams, E....Pentreffynow, Holywell
†Williams, John...Gwernhefin, Bala
Williams, John...Rhuddlan, Rhyl
†Williams, Owen John...Bodelwyddan, St. Asaph
†Williams, R. Ap Hugh...Bodelwyddan, St. Asaph
Williams, Thomas...Stalloe, Montgomery
†Williams, Wm....Plasgwyn, Pentraeth, Anglesey
†Williams, Sir W. Granville, Bt....Pengwern, Rhyl
Wood, E. B....Moreton Hall, Chirk
Woosnam, Richard...Glandwr, Llanidloes
†Wright, P....Millington Hall, Churchstoke
Wynne, Brownlow W....Garthewin, Abergele
Wynne, John Lloyd...Coed Coch, Abergele
Wynne, Owen Slaney...Ruabon
Wynne, Robert...Bachymbyd, Denbigh
Wynne, William W. E....Penlarth, Towyn

SOUTH WALES.

Governor.

Cawdor, Earl of....Stackpole Court, Pembrokeshire

Members.

Allen, R....Ty-to-Maen, St. Mellons, Cardiff
†Bailey, Sir J.R., Bt., M.P...Glanusk Pk., Crickhowell
†Baird, Alexander...Robeston Hall, Milford Haven
Ball, James...Peterstone Mills, Cardiff
Bowen, James B., M.P....Llwyngwair, Newport, Pembrokeshire
Bradley, Edward...Cowbridge
Bridgwater, Rees W....Great Porthamel, Talgarth
Buckley, James...Penyfai House, Llanelly
†Budd, J. Palmer...Ystalyfera, Swansea
Byrde, Colonel...Goytree House, Pontypool
Clark, George T....Dowlais House, Merthyr Tydvil
†Cooke, Walter H....Ewenny Cottage, Bridgend
Corbett, John Stuart...Cogan Pill, Cardiff
†David, Edward...Llandaff
Davies, B. L....Gelly Pumpsaint, Llandilo, Carmarthen
Davies, D. Price...Troedybryn, Aberystwith
Davies, John...Alleston, Pembroke
Davies, John Morgan...Froodvale, Llandilo
†Davys, R. Campbell...Nanaddfawr, Llandovery
Edwards, William...27, The Walk, Cardiff
Ellis, Philip P....Herbrandstone Hall, Milford Haven
Emlyn, Viscount, M.P....Golden Grove, Carmarthen
Evans, Lieut.-Col. H. D...Highmead, Llanybyther, Cardigan
†Evans, Henry J....Bank, Cardiff
Evans, James Eaton...Milford Haven
Evans, John...Roath, Cardiff
Evans, William...Fron, Llandovery, Carmarthen
Fisher, George...Bute Villa, Cardiff
Fitzwilliams, E. C. L....Adpar, Newcastle Emlyn
†Forrest, R....St. Fagans, Cardiff
Fownes, Robert...St. Fagans, Cardiff
†Franklin, Richard...Clemenstone, Bridgend
Gardener, W. H....Llanerfyl, Welshpool
Gardiner, Robert...Birch Grove, Aberystwith
Garsed, John...Llantwit Major, Cowbridge
†Gower, Erasmus...Castle Malgwyn, Boncath
†Gower, R. Frederick...Castle Malgwyn, Boncath
Green, Stephen...Haverfordwest
Griffith, C. M....Llwynduris, Llandyssil
Griffiths, R. Ll....Merrion Court, Pembroke
Gwyn, Howel...Dyffryn, Neath
Hancock, James...Priscaston, Pembroke
Harvey, R. Hart...Slade House, Haverfordwest
Hatchett, John...Preswylfa, Neath
Hawkins, T., jun....The Moat, Knigluton

Hellyer, G. W. M....Pentre Iago, Glasbury
†Hewitt, W. H....Glanonney, Crickhowell
Homfray, J. R....Penllyn Castle, Cowbridge
†Howell, John L....Bargold, Cardiff
Hughes, T. H. R....Nenadd fawr, Lampeter
†Hulme, William...The Bank, Pembroke
Huntley, W. V....Welsh St. Donatts, Cowbridge
Insole, J. H....Ely Court, Llandaff
James, Capt. John...Aberclyn, Brecon
James, Richard...High Street, Haverfordwest
Jenkins, R. D....Cilbronan, Cardigan
Jenner, B. St. Albyn...Bryn-tirion, Bridgend
Jennings, Richard...Carmarthen
Jones, J....Llandyssil
†Jones, John, M.P....Blaenos, Llandovery
Jones, John...Coedlananfawr, Llanybyther
Jones, Thomas...Talardd, Pencader, R.S.O.
Jones, William...Cefn Llogell, Castletown, Cardiff
Jones, William...Llwynygroes, Lampeter
Jones, William...Pantrewgoch, Castletown, Cardiff
Leach, Henry...Corston, Pembroke
Lewes, Colonel John...Llanllar, Talsarn
Lewis, George...Flimstone, Pembroke
Lewis, Jacob...Roydr Farm, Llandaff
Lewis, James...The Rest, Porthcawl, Bridgend
Lewis, John Lennox G. P....Henllan, Narberth
Lewis, W. H....Clynfiew, Boncath
Lewis, W. T....Mardy, Aberdare
†Leyson, William...Peniscynwor, Neath
Little, William...Aberaman, Aberdare
†Llewellin, Richard...Tregwynt, Fishguard
Longcroft, Charles R....Llanina, New Quay
†Mansell, Sir John, Bart...Maesdilo, Llandilo
Marsh, R....Pen-y-bedd, Burry Port, Carmarthen
Moir, Charles...Cardiff
†Morgan, Colonel the Hon. F. C., M.P....Ruperra Castle, Newport
Morgan, Henry...Llwyn, Llandovery
Morris, Edwyn John...Gwernaffell, Knighton, Radnorshire.
Mousley, T. Turner...Stackpole Court, Pembroke
†Nicholl, G. W....Llantwit Major, Cowbridge
†Nicholl, Mrs....Merthyr Mawr, Bridgend
Norton, Henry...Greenhill, Carmarthen
†Owen, Daniel...Ash Hall, Cowbridge
Palling, J. G....Castletown, Cardiff
Peel, William...Taliaris Park, Llandilo
Pell, Jonathan...Aberystwith
Penrice, Thomas...Kilvrough, Swansea
Powell, D. Jeffreys...The Court, Bronllys, Talgarth
Powell, Joseph...Pembroke
†Powell, W. S....Eglwysnunyd, Taibach
Price, Alfred B....The West, Bridgend
Prichard, W....Bryn-tirion, Bridgend
Pryse, Colonel...Peithwyll, Bowskeet (Shrewsbury)
†Pryse, Sir Pryse, Bart....Gogerddan, Bowskeet
†Pugh, David...Manoravon, Llandilo
†Reece, Edward B....Roath, Cardiff
Rees, G. Arthur...Divlyn, Llandovery
Rees, John...Hendre, St. Dogmells, Cardigan
Rees, John...Tile House, Lanmaes, Cowbridge
Rees, Mansel...Llanelly
Rees, William...Penywaun, Lanvabon, Pontypridd
Ricards, Robert...Castlefields, Cardiff
Roberts, W. B....Lovestone, Pembroke
†Rosser, William....Llanelly, Carmarthen
†Scourfield, Sir Owen H. P., Bart...Williamston Haverfordwest
†Severn, J. Percy...Penybont Hall, Penybont
†Sheild, William H....Lampeter Valley, Narberth
Sheppard, O...Rhesta, Neath
Smith, J. J....Jeffreston Farm, Tenby
Spencer, Joseph E....Fonmon, Cowbridge
Spencer, Michael...West Aberthaw, Cowbridge
†Stacey, F. E....Llandough Castle, Cowbridge
†Stewart, W. M....Haefodneddyn, Llandilo
Talbot, C. R. Mansell, M.P....Margam
Thomas, D. Howell...Derllys Court, Carmarthen
Thomas, Edward...Caira Farm, Cardiff
Thomas, George...Ely Farm, Cardiff
Thomas, George...The Heath, Cardiff
Thomas, John...Eastfield House, Cowbridge
Thomas, John...Knighton
Thomas, J. Howell...Starling Park, Carmarthen
Thomas, Thomas...St. Hilary, Cowbridge
Thomas, T. E....Trehale, Penycwm, Pembroke
Thomas, William...Sulby, Cardiff
Traherne, G. M....St. Hilary, Cowbridge
Trotter, Alexander...Edwinsford, Llandilo
†Turbervill, Lieut.-Col....Ewenny Priory, Bridgend
Vaughan, Captain Herbert...Brynog, Talsarn
Vaughan, J. W....Velin Newydd House, Brecon
†Vaughan, Nash V. E....Rhesta, Neath
Vaughan-Pryse, J. P....Bwlchbychan, Llanybyther
†Vivian, H. Hussey, M.P....Park Wern, Swansea
Waldron, Clement...Cardiff
Waring, Thomas...Park Place, Cardiff
Watt, J. W. Gibson...Doldolowe, Radnorshire
Whittall, T....Bailey Inon, Llandrindod Wells
Wienholt, F....Langharne
Williames, Charles H....Roath Court, Cardiff
Williams, Christopher...Glyn Teg, Ely, Cardiff
Williams, Captain G. G....Wallog, Aberystwith
Williams, John...Llausannor Court, Cowbridge
Williams, Rees...Aberyskin Court, Brecon
Williams, Rees David...Closcedy, Brecon
Williams, R. Wyndham...Windsor Villa, Cardiff
Williams, W....Splott Farm, Cardiff
Williams, W. Propert...Trehowell, Fishguard
Williams, W. W....Hendre, Solva, Pembroke
Wright, W. Twaites...St. Nicholas, Cardiff
Yorath, Evan...Moulton Farm, Cowbridge
Yorath, Henry ...13, St. John Street, Cardiff

IRELAND.

Members.

Abercorn, Duke of, K.G....Baron's Court, Newtown Stewart, Tyrone
Adams, George F....South Mall, Cork
Allen, George...Unicarville, Comber, Co. Down
Anderson, T...Levitstown, Mageney, Co. Kildare
Bagot, Rev. R. Wolfe...Fontstown, Athy, Kildare

Baldwin, Professor...Glasnevin, Dublin
Bessborough, Earl of...Pilltown
Borthwick, John...Prospect, Carrickfergus
†Bradford, Samuel...Carnbeg, Dundalk
Browne, D. H....Ahaserahagh, Ballinasloe
†Browne, Lord John T....Westport, Co. Mayo
†Bulwer, Walter Redford...Barrowford, Athy
†Callan, P....Dowdstown, Ardee, Co. Louth
Callwell, Lieut....Lismoyne, Dunmurry, Co. Antrim
Campbell, Arthur J....St. James's Place, Fermoy
Campbell, M....Cloucher Castle, Maryborough, Queen's Co.
Carroll, W. Hutchinson...Tulla House, Nenagh
Castletown, Lord...Granstown Manor, Ballycola, Abbeyleix
†Caulfield, St. George...Donamor Castle, Roscommon
†Charlemont, Earl of...Charlemont House, Dublin
†Clarina, Lord...Elm Park, Limerick
†Clonbrock, Lord...Clonbrock, Ahaserah
†Collis, S. Edward...Tarbert, Co. Kerry
Cooper, E. H....Markree Castle, Colloney, Sligo
†Cosby, R. G....Stradbally Hall, Queen's County
Crawford, W. H....Lakelands, Cork
Crosbie, William T....Ardfert Abbey, Tralee
Cuffe, Joseph P....11, Mountjoy Square, Dublin
†Doneraile, Viscount...Doneraile Court, Co. Cork
Downing, John...Ashfield, Fermoy
†Farrell, E. W....3, Merrion Square East, Dublin
Farrell, John Arthur...Moynalty, Co. Meath
Featherstonhaugh, R....Rockview, Killucan
†Filgate, L. G. P....Lisvenney, Ardee
Forster, A. T....Garrettstown, Kinsale
Franks, M. H....Westfield, Mountrath, Queen's Co.
Garde, Thomas...Ballinacurra, Middleton, Co. Cork
Garfit, Charles...Queenstown, Co. Cork
Goulding, William...103, Patrick Street, Cork
Graham, Richard T....Donadea, Kilrock, Co. Kildare
Greene, John...Millbrook, Magany
Gumbleton, R. J. M....Glanatore, Tallow, Co. Waterford
Hamilton, C. W....Hamwood, Clonee
Hannan, Benjamin...Riverstown, Killucan
Headford, Marquis of...Headford, Kells
†Henry, Mitchell, M.P....Kylemore Castle, Galway
Holmes, W....Clovervale, Island Magee
†Jones, W. Bence...Lisselan, Clonakilty
†Keane, R. F...Derrihun, Cappoquin, Co. Waterford
Knox, O. N....Mount Trenchard, Foynes
Leigh, Francis A....Rosegarland, Foulksmill
†Lismore, Viscount...Shanbally, Clogheen
†Longfield, R. E....Longueville, Mallow
†Longford, Earl of...Packenham Hall, Westmeath
Low, Gavin...Scribblestown House, Co. Dublin
†Low, George...Burghtown, Athy, Kildare
Mackenzie, James...Camden Quay, Cork
Mackenzie, W....34, Dawson Street, Dublin
†Mahon, H. J. P....Strokestown House, Roscommon
McClintock, Major...Hillsborough, Co. Down
Mayne, Joseph...Warren Point, Co. Down
Mead, W. R....Ballymartle, Ballinhaseig, Kinsale
Naper, James Lenox...Loughcrew, Oldcastle
Owen, Arthur J....Blessington, Wicklow
Owen, William...Blessington
Purdon, Edward...Bachelors' Walk, Dublin
Quinn, Peter...The Agency, Newry
Reynell, Richard...Killynon, Killucan
Robertson, J....La Mancha, Malahide, Dublin
Rose, Miss....Mulliaghmore, Monaghan
Rutherford, James...Fernside, Killiney
Slattery, Denis F....Coolnagour, Dungaroon, Waterford
Smith, James...Little Moyle, Carlow
Stawell, Colonel...Kilbrittain, Bandon, Cork
Stephens, G. A....Greenwood, St. Doloughs, Co. Dublin
†Stewart, A. J. R....Ards House, Co. Donegal
Stuart de Decies, Lord...Dromana, Cappognin, Waterford
Sullivan, Rev. J....Leopardstown, Foxrock, Dublin
†Sweetman, John....Drumbarrow, Kells, Co. Meath
Talbot, George W....Maryborough, Queen's County
Telford, Stephen...The Abbey, Athy, Kildare
†Templemore, Lord...Dunnoby Park, Wexford
†Templetown, Viscount...Castle Upton, Templepatrick, Belfast
Thompson, John...Sandymount, Tipperary
†Tighe, Right Hon. W. F...Woodstock Park, Inistioge
†Townshend, C. U....Burlington Road, Dublin
†Trench, Henry...Cangort Park, Roscrea
†Trousdell, W. B. P....Aughrim Park, Athenry
Vaux, Lord...Rosmead, Castletown, Delvin
†Verner, E. Wingfield, M.P....The Aske, Bray
Vesey, Lieut.-Colonel....Lucan House, Dublin
Webber, W. Downes....Mitchelstown Castle, Co. Cork
†Wilbraham, Hugh...Westport, Co. Mayo
†Williams, Francis E....Derreana Lodge, Waterville
Wise, Josias P....Rostellan Castle, Cloyne

SCOTLAND.

Governors.

Buccleuch, the Duke of, K.G....Dalkeith House, Edinburgh
†Dunmore, Earl of...Dunmore

Members.

Armstrong, William Jones...Fairlie, Greenock
†Askew, Sir H., Bt....Pallinsburn Ho., Coldstream
†Askew, Watson...Pallinsburn, Coldstream
†Aytoun, R. S....Inchdairnie, Kirkcaldie
†Baird, Alexander...Urie, Stonehaven
†Balfour, Colonel David...Balfour Castle, Kirkwall
†Balmer, Thomas...Fochabers
†Beattie, James...Newbie House, Annan
Beattie, Simon...Annan
†Bell, James...170, Argyle Street, Glasgow
Bethune, Alexander...Blebo, Cupar, Fife
Biscoe, T. P. B....Kingellie Ho., Newton, Inverness
†Bruce, Thomas R....Slogarie, New Galloway Station
†Calverley, C. C....University Club, Edinburgh
†Cathcart, R....Pitcairlie House, Auchtermuchty

†Cecil, Lord Arthur...Orchardmains, Inverleithen
†Cecil, Lord Lionel...Orchardmains, Inverleithen
Christison, John...Home Farm, Floors Castle, Kelso
Cochrane, James...Greenhill Gardens, Edinburgh
†Cruickshank, Edward...Lathenty, Inverurie
Drew, Lawrence...Merryton, Hamilton
†Duncan, James...Benmore
Elcho, Lord, M.P....Armisfield, Haddington
Fenton, John...Redkirk, Annan
Ferguson, Lieut.-Col....Pitfour, Mintlaw, Aberdeen
Finlay, A. S....Castle Toward, Greenock
†Fleming, J. Nicol...Knockdon, Ayrshire
Forbes-Mitchell, J....Thaviston, Kintore
†Fowler, John A....Inverbroom, Garve
†Galloway, Earl of...Galloway House, Garliston
†Grant, Sir G. M., Bart....Ballindalloch Castle
†Greig, George...Uppat House, Boora, Sutherland
†Guthrie, John...Guthrie Castle, Forfarshire
†Haig, James R....Blairhill, Stirling
†Hamilton, Captain A....Rozelle, Ayr
†Hamilton, John...Sundrum, Ayr
†Hope, A. Peterkin...Oxwell Mains, Dunbar
†Hutchison, Robert...29, Chester Street, Edinburgh
Kennedy, Rt. Hon. T. F., Dalquharran Castle, Maybole
†Lawson, Charles...George Square, Edinburgh
Learmouth, T. L....Park Hall, Dolmont
†Leith, Alexander...Glenkindie, Inverkindie
Macandrew, Henry C....Midmills, Inverness
McCreath, William...Girvan, Ayrshire
MacDouall, James...Smeaton, Prestonkirk
McIlwraith, John...Dunure, Ayr
†MacLagan, Peter, M.P....Pumpherstone, Midcalder
†McQueen, James...Crofts, Dalbeattie
Martin, John M., jun....Broomhill, Cardross
†Maxwell, Sir J. Heron, Bt....Springkell, Ecclefechan
†Maxwell, Capt. J. R. Heron..Sprinkell, Ecclefechan
†Maxwell, R. C. Heron...Springkell, Ecclefechan
†Maxwell, Wellwood H....Munches, Dalbeattie
Milne, David...Paxton House, Berwick
Mitchell, Andrew...Alloa
†Mollison, James...Dochgarroch Lodge, Inverness
†Montgomery, Andrew...Boreland, Castle Douglas
Murray, G. Wilson...Banff
†Ogilvy, Lieut.-Col....Millhill, Inchture
Ogilvy, Sir J., Bt....Baldovan House, Dundee
Payne, James...Thornhill, Dumfries
†Pratt, J. R. F....35, Queen Street, Edinburgh
Reid, George...Guild Street, Aberdeen
†Rutherford, George...Printonan, Coldstream
Shield, James, jun....Upper Ravensdowne, Berwick
Shirriff, Samuel D....Saltcoats, Drem
†Smith, George P....Chorcelie, Dunse
†Stables, W. Alexander...Cawdor Castle
†Stewart, Mark John...Ardwell House, Stranraer
†Strathallan, Viscount...Strathallan Castle, Auchterarder
†Taylor, Charles H....Cornhill, Coldstrea
†Templeton, Andrew...Glasgow
†Thompson, Andrew...Berwick-on-Tweed
Turner, John J....2, Montague Street, Edinburgh
Vernon, Hon. Greville R...Auchans Ho., Dundonald
†Welsh, John...Kirkton, Hawick
Wemyss and March, Earl of...Gosford, Longniddry
†Wilson, Professor John...University, Edinburgh
†Wilson, John...Wellnage, Dunse
†Wood, C. L....Freeland, Bridge of Earn
Wyllie, William...Fenwick, Ayrshire

FOREIGN COUNTRIES.

Members.

†Ahlborn, Edward...Hildesheim, Hanover
†Amezaga, Camilo...Atocha, Madrid
†Ananoff, Alexander...Kontais, Russia
†Ananoff, Ivan...Moscow, Russia
†Benson, George...Sydaport, Madras
†Bixio, Maurice...26, Rue Jacob, Paris
†Blacker, M. M...Amelia Court House, Virginia, U.S.
†Borie, Victor...90, Rue d'Assas, Paris
†Bortier, Monsieur...43, Rue Royal, Brussels
Buckland, George...Toronto, Canada
†Bunsen, G....Bourg-Rheindorf, Bonn
Campbell, C. L....51, Boulevard Bineau, Neuilly Paris
†Cockrane, M. H....Montreal
†Corbett, Captain R. J....Hyères, Var, France
Custance, John T....Tokai, Japan
†Dacre, Henry...Auckland, New Zealand
†Davenport, F. H....Genara, Nanango, Queensland
†D'Azy, Count Benoist...88, Rue de Grenelle, Paris
†Decauville, M....Petit Bourg, Corbeil, France
†Decauville, M. Paul...Petit Bourg, Corbeil, France
†De Kergolay, Count...Camisy (Manche), France
Delano, William H....119, Quai de Valmy, Paris
†De Monicault, E...127, Boulevard Haussman, Paris
†Densy, Ernest...Chateau de la Pacandière, Lucay-le-Mâle (Indre), France
†De Voguë, Marquis...37, Rue de Burgoyne, Paris
†De Westphalen, Count Clemens...6, Herringasse, Vienna, Austria
†De Wezele, Count...Chateau de Montboron, Nice
†Dixon, Alexander C....Colombo, Ceylon
†Du Buat, Count...Chateau de la Sunardière (Mayenne) France
†Du Plessis, Gustave...Chateau du Plassi, par Metray (Indre et Loire) France
†Duval, Ferdinand R....53, Rue Francois 1st, Paris
†Eder, Carl...Hauptgasse, No. 25, Penzing, bei Wien, Austria
†Erkoig, Adolphus...Derekegyhaza, Pesth, Hungary
†Escobar, Alfredo...Bogata, New Granada, U. S. of Columbia
†Ewayama, Naoki.....Agricultural Department, Tokai, Japan
Finlay, A. K....Glenorminton, Noorat, Victoria, Australia
†Fleetwood, Baron A....Asvik, Solerkoping, Swedon
†Giglioli, Italo....Casa Sala, 20, Via Roma, Zorino, Italy
†Grandeau, Louis...Nancy (Meurthe), France
†Heathcote, Lieut.-Col. C....Dharwar, Bombay Presidency
†Hoffschlaeger, J. F....Welsin, bei Mecklenburg

†Holloweg, M. de B....Runorva, Vandsburg, Prussia
†Janasz, D. J....Warsaw, Poland
†Jay, John...West 17th Street, New York
†Jobez, Charles...17, Boulevarde Madeleine, Paris
†Jones, A. Owen...Maryborough, Queensland
Jones, John R....Brisbane, Queensland
†Koerner, Theodore...Hofleben, Schonsee, Thorn, West Prussia
†Lawford, Thomas, jun....London, Canada West
†Le Grande, Emile...Thunstetten Castle, Langenthal Canton, Berne, Switzerland
†Loesch, Heinrich...Cammerswaldau, Prussia
†Lutteroth, Robert...Aaron, Switzerland
†Lythall, A....Hybenergasse, Prague
†Mangon, Hervé...69, Rue St. Dominique, Paris
†Mannsfeld, Count...Dobrisch, Austria
†Martin, Antoine...Malagnow, Geneva
†Morris, Colonel...Morrisania, New York
†Moulin, Jules N....Rue de Chartres, Illiers, Eure et Loir
Mulder, Dr. Louis...Muzenstraats, The Hague, Holland
†Nadosy, General...21, Spetgelgasse, Vienna
†Nathusius, Baron G....Hundisburg, Alshaldensbleben, Prussia
Newton, Thomas...Buenos Ayres
†Otrante, Count...Nygard, Söderköping, Sweden
†Parkinson, Robert...Brisbane, Queensland
†Perales, Marquis de...Madrid
Riddock, John...Yallam Park, Penola, S. Australia
Riley, Major, J. E....53, Rue Beaurefranc, Boulogne-sur-Mer
†Rivett-Carnac, H....Allahabad, India
†Robinson, William...Madras
Ronna, Antonio...25, Boulevard Haussmann, Paris
†Savignon, Don Domingo...Mexico
†Schollick, J. S. Fortescue ... Princes Street, Melbourne, Australia
†Sladen, Charles...Geelong, Victoria, Australia
†Smallbones, Paul G..Velm,Gramat, Neusedd, Vienna
†Sverdrup, Thorwald...Fredericksvaern, Norway
†Tachard, Albert...Niedermorschwiller, Dornach (Alsace-Lorraine)
†Tanner, Thomas...Napier, Hawkes Bay, New Zealand
†Thenard, Baron...6, Place St. Sulpice, Paris
†Thomas, G. T....Ermatingen, Canton Thurgovie, Switzerland
†Thoms, Professor G....Riga, Russia
†Tiersonnier, A....Chateau du Columbier, Nevers
Trehonnais, R. F. de la...Chateau de Saron, Mareilly-sur-Seine, Marne, Francis
†Tucher, Baron August...Nuremberg
†Usedom, The Baron von...Berlin
†Valle, Con de Del...Vergana, Gurpoisea, Spain
†Van Alen, J. J....21, West 27th Street, New
†Zoeppritz, G....14, Friedrichstrasse, Stuttgart

Members whose Residences are Unknown.

Governors.

†Harcourt. G. Simon
†Tanqueray, John Samuel

Members.

Adamson, John
†Baker, John
†Batson, Thomas
Boucherette, Henry Robert
†Bowyer, Captain H. A.
Bright, John
†Burnham, W. H.
†Charley, Richard
†Clarance, John
†Clinch, Charles
Cobb, George Henry
De Curzay, Viscount
Eaton, John
†Elliott, John
†Findlay, John
†Gammie, George
†Gilford, William
Grier, W. M.
†Hall-Dare, F. M.
Hanning, James
Hughes, Alfred
†Ivimy, E. T.
†Johnson, R. W.
†Johnston, A. R.
†Kelsall, Henry, jun.
†Kettle, G. Mackenzie
†Lawton, W. F
†Louch, F. W.
†Lushington, C. Manners
†Lyall, William
†Mackenzie, J. H.
†Mangles. F.
†Matson, William B.
†Meyer, P. Herman
†Mumford, William Henry
†Parkinson, Thomas
†River, John
Sharp, Granville
Simpson, S. M.
Slade, A. F
Stanley, W. Hans Sloane
Swindley, Major
†Taylor, Thomas
Tompkins, John
†Umbers, Edward
†Wainman, B.
†Watson, J. G.
†Wells, Grenville G.
†Westhorpe, Rev. R. A.
†Wharton, Rev. J. C.
†Wharton, Rev. W. F.
Winthorpe, Rev. Benjamin
†Young, George

Honorary Members.

Barral, Monsieur...84, Rue Grenelle, St. Germain, Paris
Boussingault, Professor...Paris
Brown, Professor...44, Parliament Street, S.W.
De Barry, Professor...Strasbourg
Dannfelt, C. Juhlin...Stockholm
De Lavergne, M. Leonce
Drouyn de L'huys, His Excellency M...1, Rue le Peletie Paris
Egypt, His Highness The Pasha of
Fleming, Geo....30, Cambridge Road, Kilburn, N.W.
Hofman, Dr.
Lecouteux, M. Edouard...26, Rue Jacob, Paris
Playfair, Rt. Hon. Lyon, C.B., M.P....University, Edinburgh
Sanderson, Dr. Burdon...49, Queen Anne Street, W.
Simonds, Professor..Royal Veterinary College, N.W.
Solly, Professor...Park House, Sutton, Surrey
Stockhardt, Hofrath...Tharand, Saxony
Swartz, Mr....Hofgarden, Wadstena, Sweden
Tesdorpf, Mr....Ourupgaard, Falster, Denmark
Voelcker, Professor...11, Salisbury Square, E.C.
Way, Professor...9, Russell Road, Kensington, W.

LONDON: PRINTED BY WILLIAM CLOWES AND SONS, STAMFORD STREET AND CHARING CROSS.