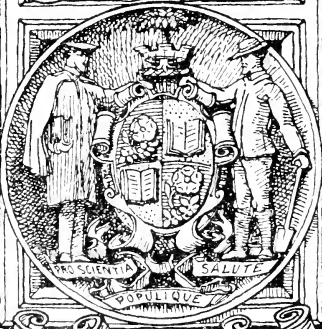




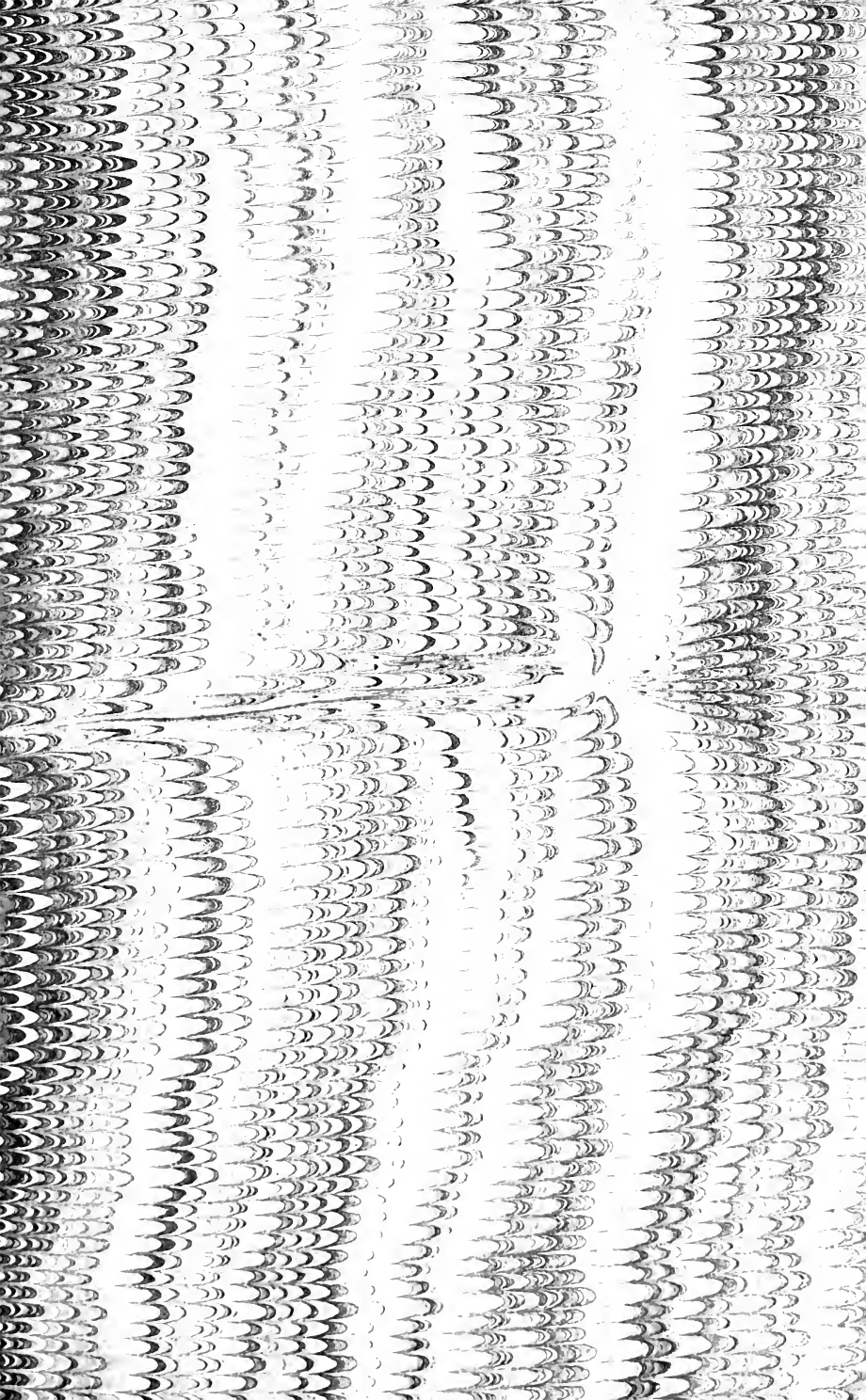
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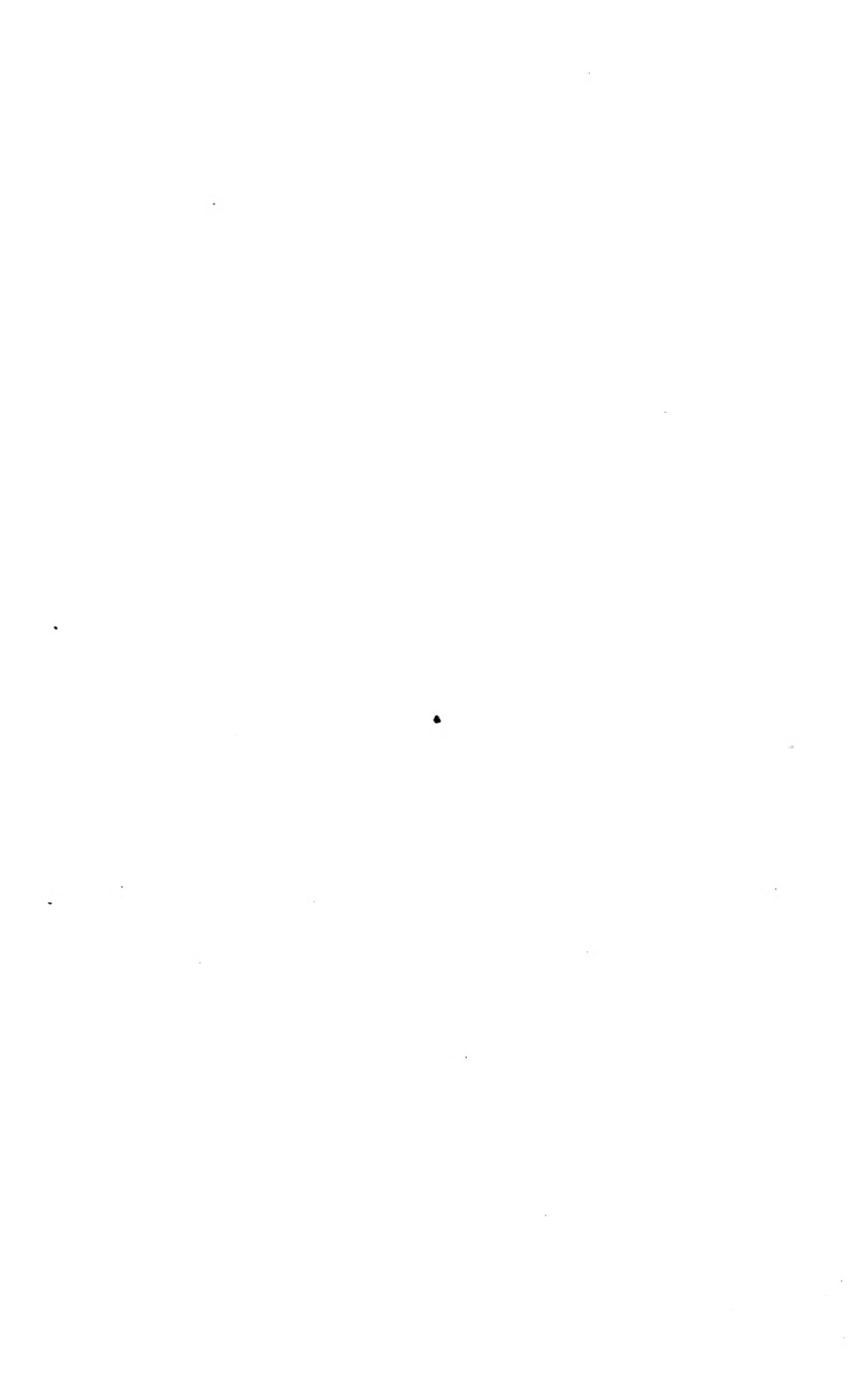


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WITH
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BY THE SOCIETY IN 1877, AND LIST OF MEMBERS.

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TRANSACTIONS
OF
THE HIGHLAND AND AGRICULTURAL
SOCIETY OF SCOTLAND.

ON THE AGRICULTURE OF THE COUNTIES OF EDINBURGH
AND LINLITHGOW, AND THE INDUSTRIAL PROGRESS
AND DEVELOPMENT OF THESE COUNTIES DURING
RECENT YEARS.

By THOMAS FARRALL, Aspatria, Carlisle.

[*Premium—Fifteen Sovereigns.*]

Introductory Remarks.

THE agriculture of the Lothians already possesses a considerable literature, especially the county of Haddington, which has often formed the subject of essays, reports, and reviews. In the present paper it is our intention to describe the agriculture of Mid and West Lothian, which are embraced in the counties of Edinburgh and Linlithgow. The two Lothians under consideration lie side by side, and on the north are washed by the waters of the estuary of the river Forth. They are therefore situated in the eastern part of the southern division of Scotland. The figure of Edinburgh proximates closely to that of a half moon, resembling, on a coloured map, the outstretched wings of a butterfly. Its extreme length from east to west is about 36 miles, and its breadth from north to south about 24 miles. The superficial area was computed by the authors of "Caledonia," and of the "Agricultural Survey of Mid-Lothian," at 229,120 and 227,832 imperial acres respectively; but more recently it has been ascertained on reliable authority, that the area is 367 square miles, or 234,926 statute acres. Mid-Lothian lies between 55° 39' 30" and 55° 59' 20" north latitude, and between 2° 52' and 3° 45' 10" longitude west from Greenwich. The shire contains

forty-eight *quoad civilia* parishes and part of two others. The county throughout presents a striking scene of industry, not only in an agricultural point of view, but also with respect to mining and other profitable resources. Though it cannot lay claim to high mountains, like the lofty Ben Nevis or the majestic Ben Lomond, yet it is not entirely destitute of mountain chains of an inferior order. Most prominent are the Pentland Hills, which appear in continuous and parallel ranges from Peeblesshire, on the south, and sweep along the centre of the county, rising in Cairnhill to upwards of 1800 feet above sea-level. In the east are the Muirfoot Hills, which are a continuation of the Lammermuir Hills. About one-third of the entire extent may be estimated as the proportion inaccessible to the plough. This lies chiefly in the south and south-east parts of the county, and produces sweet and healthy herbage, which supports large flocks of sheep. In the north and west, the land, although diversified by rising grounds and gently undulating eminences, is mostly capable of cultivation, and produces a variety of crops which tend to bring credit to the farmer, to enrich the agricultural district, and beautify the far-extending prospect.

Owing to its peculiar configuration, Edinburgh possesses no stream deserving to be dignified with the title of river; it is, nevertheless, well watered by numerous burns or waters. The Almond, after intersecting a wing of the parish of Mid-Calder, forms the north-west boundary line to the sea. Leith water rises in the parish of Mid-Calder, and after pursuing a course of over 20 miles in a deep bed between well-wooded declivities, enters the sea at Leith. The largest stream in the county is the Esk, which, with its tributaries, drains the whole extent of country lying between the Pentland and Muirfoot ranges of mountains, and empties itself into the sea at Musselburgh. The remaining notable streams are the Tyne and the Gala. The former holds a sinuous course of 7 miles, and then flows into East Lothian; while the latter, after running a distance of 10 miles, leaves the county at its south-west angle.

Linlithgow, or West Lothian, lies between $55^{\circ} 49'$ and $56^{\circ} 1'$ north latitude, and $3^{\circ} 18'$ and $3^{\circ} 51'$ west longitude. Its greatest length is about 20 miles, and its extreme breadth about 15 miles. According to Armstrong's map of the Lothians, the area is only 112 square miles, or 71,680 statute acres, but the area given by the Ordnance Survey is 127 square miles, or 81,114 acres. The surface of Linlithgow, though not so interesting as that of Edinburgh, is, notwithstanding, exceedingly diversified and beautiful. The centre of the country may be described as an elevated plateau surrounded by an amphitheatre of hills, the culminating point being Cairnmaple, which rises to a height of 1498 feet. Other elevations are Kipps-hills, Knock-hills, and

Drumcross-hills; and in the west, Cuckold-le-Roi, with an elevation of about 500 feet. Generally, the eminences are inconsiderable hills or elevated grounds, covered with fields of waving corn, ornamental plantations, or pasture lands dotted over with sheep. About three-fourths of the land is arable, and the soils are generally fertile and well-drained.

Linlithgow is very well watered. Logie-water, a tributary of the Avon, and its affluents Barbauchlaw-burn and Ballencrieff-water, drain much of the western division; while Broxburn and several inferior streamlets drain the eastern, and find their way into the Almond. Flowing into the Forth are Nethermill-burn, Dolphinston-burn, and some tiny brooks. These several streams, though totally insufficient for navigation, are useful in supplying power for driving machinery, and furnishing never-failing supplies of water for other purposes. The principal lakes are Loch-coat in Torphichen, and Linlithgow-loch in the parish whose name it bears, with two or three smaller ones on the boundary.

Interesting associations crop up in the mind of any one who "loves to dwell on bygone scenes," as he visits the various towns in Mid and West Lothian. Edinburgh, the capital of the former, and the metropolis of Scotland, is delightfully situated upon a group of hills overlooking the Firth of Forth. On the highest of these the old town is built. From the castle, which stands upon an elevation 380 feet high, a commanding and magnificent prospect may be had. This gorgeous view has been well described by Sir Walter Scott, in his "Marmion." The Gaelic form of the name of the city was Dunedin, from *dun*, a Celtic word meaning hill or fort, and Edin or Edwin, king of Northumbria, 617 A.D. Hence Dunedin and Edinburgh have the same meaning. When the fine palace of Holyrood Abbey was erected in 1128, the city was a royal burgh, and a royal residence was supposed to have been built a short time afterwards. Until the 15th century Edinburgh remained defenceless, when King James II. granted a licence for fortifying it. Great improvements and enlargements in buildings have been made within the past seventy years, but the union of the two kingdoms doubtless checked very much the advancement of the city. The new town, for beauty of design and excellence of architecture, is not rivalled by any town in Great Britain. Edinburgh is supplied with water from the Pentlands, and the sanitary condition has much improved of late years. The population in 1871 was 196,500. Two members are returned to the House of Commons. Dalkeith is distant from Edinburgh about 6 miles in a south-east direction. The town is well built, and has a large weekly market for grain. It has also manufactures of brushes, woollen stuffs, and felt, beaver, and straw hats. In the neighbourhood are some large collieries. The population in 1871 was 7114. Standing upon

the site of an ancient castle is the splendid mansion of the Duke of Buccleuch, with its beautiful and well-wooded grounds. Musselburgh, a royal burgh, is situated upon the eastern bank of the Esk, where it enters the Firth of Forth, $5\frac{3}{4}$ miles east of Edinburgh. The manufactures are haircloth and sailcloth. It has also a small amount of trade in tanning and leather-dressing. The neighbourhood is rich in historical lore. A little to the east is the battle-ground of Pinkie, where the English defeated the Scotch in 1547. In the immediate neighbourhood was also fought the battle of Prestonpans, in 1745, when the royal army sustained a signal defeat by the forces of Charles Edward. The port of Musselburgh has no vessels of its own, but is resorted to by coasters, which bring in timber, oil-cake, bark, seeds, and hides; the export trade being chiefly in coal. The links are much resorted to for racing, golfing, and other sources of amusement. The population of the town in 1861, was 7423. Many of the inhabitants are engaged in the "harvest of the sea." Situated about 2 miles north-east of Edinburgh is Leith, whose commercial importance lies in its colonial and foreign trade and imports of grain, for which it is the great emporium in Scotland. It has also considerable manufactures of glass, ropes, sails, and artificial manures. Fish-curing may be ranked among its industries likewise. So far back as the 11th century it was a port; in 1541 the town was burnt by an English fleet; in 1549 it was taken possession of by French troops; in 1567 it was sold to Edinburgh, and in 1838 it was made independent of that city. There are also several villages in Mid-Lothian, each of which has interesting associations, but scarcely such as come within the scope of an agricultural paper.

The county town of West Lothian is Linlithgow, a place of great antiquity and an early seat of the Scottish kings. It has a weekly market, and fairs are held at certain times of the year. Other places of note are Bathgate, a market town with a larger population than Linlithgow, and Borrowstounness or Bo'ness, a burgh of barony, situated on a tongue of land stretching into the Firth of Forth. At one time the town was in a flourishing condition, but it declined after the opening of the Forth and Clyde Canal, on account of the trade being turned into another channel.

Both counties are intersected by good roads, which are kept in excellent repair.

The population has gradually increased during the present century, as will be seen on reference to the following table:—

Year.	Edinburgh.	Linlithgow.
1801,	122,597	17,844
1811,	148,607	19,451
1821,	191,514	22,685
1831,	219,345	23,291
1841,	225,454	26,872
1851,	259,435	30,135
1861,	273,997	38,645
1871,	328,335	41,191

The advance in the county of Edinburgh has, therefore, in less than three-quarters of a century, been 205,738, or about 168 per cent.; that of Linlithgow, 23,347, or 131 per cent. The present population of Mid-Lothian is at the rate of 1·3 persons to each acre, and of West Lothian close upon 2. The employments of the people are variously distributed between trade, commerce, manufactures, and agriculture.

History of Agriculture.

In common with many districts south of the Forth, agriculture was pursued in the counties at a comparatively early period. It is indeed averred by some writers that this part of the country produced a considerable amount of grain in the times of the Romans; as to this, however, we cannot, in the absence of reliable information, speak with any degree of certainty. A large proportion of the land was then undoubtedly covered with forests, and the culture of corn would generally be confined to fertile patches near the sea-shore, or along the haughs where the soil was deep.

So early as the 13th century, the monks cultivated large tracts of land on the south of the Forth, and were said to be skilful in the management of extensive orchards. We also have it that they understood something of resting, if not of fallowing their lands, and the rotation of cropping. For a long period after the 13th or 14th century, history is silent upon matters relating to agriculture. It may, consequently, be reasonably assumed that small progress was made until about the time of the union of Scotland with England, when the farmers of East Lothian had opportunities of seeing for themselves the superior practices in agriculture observed in England, some of which they were not slow in copying. Neighbouring shires soon afterwards followed their example, but for a period extending to three-quarters of a century, farming did not make so much headway as could have been wished, owing not so much to the apathy of agriculturists, as to the adverse circumstances by which they were too often surrounded.

At the close of the 11th century, agriculture had made little

advancement in Mid and West Lothian. Even then, large tracts of the country were covered with forests, and the pastoral pursuit was almost exclusively in the hands of the wealthy, who owned large flocks of sheep, which roamed upon the uplands and depastured in the woods. What little arable land was in cultivation was in the hands of the poor, who had neither capital to expend nor energy to carry on their pursuits. The small patches they cultivated were chiefly composed of the best soils in sheltered situations, or the partially alluvial deposits by the sides of the streams. These soils were scourged by successive cropping, rendered filthy by the growth of weeds, and reduced to extreme poverty, owing to the small amount of manure given.

The reign of David I., which commenced in 1124, was a new era in agricultural improvement. This monarch gave a large share of attention to the cultivation of the land, in which he evinced considerable ability. He founded several agricultural establishments, both in Mid and West Lothian. His grange farm at Linlithgow is mentioned as being much abreast of the times. Roused by the noble example of their monarch, the barons also cultivated farms in various parts of the country, so that the agriculture of the counties under notice received an impetus which was at once salutary and lasting in its effects. David I. also devoted much attention to horticulture, and mention is made in his charter of Holyrood of his garden under the castle.

For many years after the termination of this monarch's reign agriculture may be said to have retrograded rather than progressed. The prevalence of forests was a great barrier to the extension of husbandry, for, they not only occupied much of the land, but they also afforded shelter to the warriors and freebooters who scoured the country at all seasons, and trampled down the crops of the more peaceful inhabitants. In the early part of the 14th century Edward III. lessened the extent of forest in Mid-Lothian very materially; and mills, kilns, and breweries began to be established throughout the county, thus showing that agriculture was gradually gaining ground and subduing the asperities of the soil. But even then farming was far from being on a satisfactory footing. The tillers of the ground still belonged to the poorer classes of the community, who lacked sufficient capital to carry on their avocations successfully: they, therefore, performed the duties devolving upon them reluctantly for others rather than willingly for themselves. This was chiefly owing to the unsatisfactory tenure upon which they held their farms. They not only rented the land from the proprietor but everything upon it; who, in turn, at the expiration of the tenancy, claimed everything the farmer possessed. This tenure was called "*steelbow*," which, in a modified form, still

lingers in many of the remote districts of Scotland. In Linlithgow matters were even worse, for, after the peaceful reign of Alexander III., the country was plunged into ruin by foreign invasions and domestic strifes during a period of about seventy years, when the strong oppressed the weak, and the hardly-won earnings of the industrious too often fell to the lot of cruel and oppressive invaders.

The year 1723 may be regarded as a fresh starting-point in the history of agriculture, when a society was formed in Edinburgh for the purpose of issuing instructions, illustrated by example, on the most practical and profitable methods of land culture. This was called the Society of Improvers, and from the date of its establishment cultivation in both Edinburgh and Linlithgow began to advance with rapid strides. Two years later, a sale of manure at Cuffabouts, near Bo'ness, by one Higgins, realised 1s. per bushel—thus affording an indication that the teachings of the society were doing good service. Enterprising farmers now began to spring up on all sides. Sir James Macgill, and, seventy years later, Sir John Dick of Prestonfield, carted much manure from Edinburgh, and soon converted the worn-out and barren soils under their management into fertile fields.

In the year 1728, John, Earl of Stair, introduced much that was new on his farm in the parish of Kirkliston, in West Lothian. He began to practise the horse-hoeing system of husbandry, and commenced to crop the land in rotation. A few years previous, Lord Haddington had brought clover and sown grasses into the adjoining county: these the Earl of Stair took advantage of, and began to grow upon his own farm. He also brought into field culture turnips, carrots, and cabbages, which had previously been confined to gardens. How far his turnip-culture extended we have no means of ascertaining, but since his time, there have been many claimants for the honour of being the first to cultivate field-turnips on a large scale. This enterprising earl had a noble imitator in Charles, the first Earl of Hopetoun, who even excelled the illustrious earl in farm management, but they both died in the year 1740, before they had seen their plans fully matured or their efforts appreciated.

The institution of a Farmer's Club in Ormiston, East Lothian, by Mr Cockburn, the celebrated agriculturist, about this time also gave a marked impetus to husbandry, as members began to exchange and extend their ideas, so that not only themselves but the whole community in the immediate district were benefited. In Mid-Lothian the good work once begun was not allowed to slumber, and soon after the middle of the 18th century land was limed, fences built, grasses and succulents introduced, and improved implements brought to bear upon the working of the soil. Sir John Dalrymple of Cousland, the Duke of Buccleuch, and

other gentlemen of note, spared no pains in bringing their system of agriculture to as high a pitch as possible.

Bearing the date of 1770, a minister of Dunse, Adam Dickson by name, issued a work, entitled "The Husbandry of the Ancients," which threw considerable light upon the agriculture of bygone days. This appeared at a time when men's minds were ready to grasp at new ideas upon a subject which was receiving a large share of attention. A few sentences showing the practice of the ancients may not be here deemed out of place. We cull from Mr Dickson's admirable little work:—"Varro says that land should rest every other year, or, after a severe crop, carry one that in a lesser degree exhausts the land.

"Columella says that wheat requires rich land, and that which carries a crop, and rests, and is well ploughed alternately.

"Virgil requires that the fallowed lands, after they have carried a crop, shall be again fallowed.

"And Pliny says that this direction, given by Virgil, is most proper when the extent of the farm allows it; but that if the situation of the farm does not allow this, then wheat may be sown after such crops as meliorate the soil. This kind of land that was so frequently fallowed was seldom dunged."

Mr Dickson continues in much the same strain. His book could not but form a useful companion to rising farmers at the time we speak of, and no doubt it was to a certain extent appreciated by such of the community as were readers.

In an interesting work published in 1795, by George Robertson, farmer, Granton, it is stated that the competition for farms lying around Edinburgh was so great as to reduce the profits of the husbandman to little more than legal interest on his capital. The writer thought that it was unfair of the laird or factor to exact rigorously the rent at the precise term of payment, and maintained that in order to make it, the tenant was often obliged to sell his produce at a great disadvantage. He declared that he frequently had occasion to observe the circumstances attending failure among the farmers, and could trace them to the injudicious conduct of the landlords.

The capital then employed in agriculture was L.5 the Scotch acre in the low country, L.2 in the moorlands, and 5s. on the hills. From two causes chiefly, this amount was soon afterwards thought to be inadequate: first, because all articles of stocking became dearer; and secondly, from having everything of a superior quality to what farmers were formerly satisfied with. One fourth part was therefore added, and the result found to correspond very nearly with the capital employed upon a farm near to Edinburgh, which was L.6, 5s. 3d. the Scotch acre. On the above data, the whole capital employed in Mid-Lothian farming was calculated at—

In the low country, 60,000 Scotch acres,	@	£6	5	0	=	£375,000
„ moorlands, 60,000	„	@	2	10	0	= 150,000
„ hills, 60,000	„	@	0	6	3	= 18,750
Total No. of acres, 180,000	„	@	3	0	3	= £543,750

The same author throws some light upon the sheep and horses kept at that time. A small number of black-faced sheep was bought in from year to year, generally from Tweeddale, the wool of which was coarse, and the fleece seldom worth a shilling, while the carcass rarely weighed over 12 lbs. per quarter. On the lower grounds a better class was kept, chiefly of the Cheviot breed; in some cases they were crossed with Herefords, in others with Bakewell species. These gave a fleece worth four times the amount of the blackfaces, and the weight rose from 12 lbs. to 25 lbs. per quarter. About 5000 horses were used for husbandry; of these one-half were home reared, the remainder coming from Linlithgow and Lanark. The amount annually paid for imported horses amounted to something like L.6000. After the year 1784, value in horses ran up considerably. Best sizes, 16 hands and upwards, which were previously sold at L.18 to L.20, made L.30 to L.35, and the price of smaller animals rose from L.12 or L.14 to L.18 or L.20.

Mr Robertson asserts that the condition of the labouring classes was at that time somewhat ameliorated. Their cottages were more comfortable than formerly, being larger, better lighted, and warmer. The kailyard, or plantation of cabbages, in the front was also common, and not a few kept poultry, the produce of which brought a good price in the Edinburgh market. The furniture consisted of two beds, a few chairs or stools, table, chest of drawers, press, &c., and a cuckoo-clock. Oatmeal with kail-brose formed the principal part of their food.

Another practical writer of that day added much to the literature of agriculture. We allude to Lord Kames, who wrote in an easy and interesting style, and published a work known as the "Gentleman Farmer." In it he discusses at great length the question of oxen *versus* horses for beasts of draught and burden, agriculturally considered, and finally winds up in favour of the former, making out that in the course of twelve years the difference of expense between the keep of a horse and an ox is L.74, 4s., or an average of over L.6 per year.

We now come to what may be called the era of improvements and inventions in farm implements and machinery, when grain winnowers superseded the use of through draughts in thatched barns, or the "gentle breezes on fairy knowes;" when the flail gave place to the thrashing machine; and the old-fashioned "ripper of the ground" made way for the swing-plough; but we must forbear, lest our lengthening notes be thought tedious.

Suffice it to say, that within the present century, agriculture in both Mid and West Lothian has advanced rapidly, in draining; in the deep culture of the soil; in the extended use of machinery; in the introduction and appliance of steam power to many of the most laborious offices of the farm; in the use of extraneous feeding stuffs and artificial manures; in the scientific knowledge possessed by the leading farmers; in a word, in almost everything pertaining to the satisfaction of the proprietor, the prosperity of the farmer, the happiness of the labourer, and the welfare of the community at large, as meat and bread consumers. Not that during the past seventy odd years there have been no depressions; great lessons are seldom taught without a certain amount of sacrifice on some one's part, and the agricultural panics of the present century have doubtless driven many a helpless, honest, and struggling farmer to the wall.

Climate.

The climate of the two counties is materially modified by their geographical position. Continually bathed on their northern boundary by the waters of the estuary of the Forth, extremes of heat and cold are for the most part prevented. The mean temperature of winter is rarely very low: that of summer never very high. This will be better understood by comparing the climate of Edinburgh with those of Copenhagen and Moscow—places nearly under the same parallel:—

	Mean Annual Temperature.	Mean Temperature of Summer.	Mean Temperature of Winter.
Edinburgh,	47·13	57·17	38·45
Copenhagen,	46·56	62·7	31·3
Moscow,	40·	63·9	15·2

In winter, therefore, snow seldom continues long upon the ground, except in the vicinity of the mountains, and frosts rarely lock up the soil so as to retard its cultivation. Sometimes a few nights characterised by more than ordinary severity damage the turnips in the fields; at other times the shaws retain their greenness until the returning spring again awakens the plants into active life. Cold east winds prevail in March and April, and impede vegetation to a certain extent; and night frosts, even so late as the end of May or the early part of June, have been known to blacken the potato-tops and leave their impress upon the young clovers. As a rule, however, the fields and gardens exhibit a green aspect early in the season, which shows that vegetation is not much retarded by the unfavourable influences just mentioned. Garden produce is brought into Edinburgh market earlier than it can be procured in many parts of England 200 or 300 miles further to the south, and the early strawberries grown in the immediate neighbourhood are justly held in great repute for their

delicious flavour. Late in the year the agricultural landscape often presents the varied and beautiful aspect of lingering summer, when many districts have been robbed of their charms and swept bare by the surly blasts of chill November. Within one hundred years the climate has been much improved by the drainage of wet moors and morasses; and the winds, which at times sweep over the country, modified by judicious clumps of trees or thriving belts of plantation. The summer heat is always sufficient to impart a golden hue to the wheat crops, and enable the farmer to ingather his cereals without delay or difficulty, but now and then a disastrous harvest occurs and does much injury to the outstanding stooks. In 1872 the harvesting of grain was a slow, troublesome, and expensive process, and considerable losses were experienced by most arable farmers. The season alluded to was, however, exceptional. As a further proof of the mildness of a Lothian winter, we may note that early in January 1874, Mr M'Nab laid before the Botanical Society of Edinburgh no less than 138 species of flowers in full bloom, culled from the Royal Botanic Garden on New Year's Day. Of these 35 might, he said, be considered as winter and spring flowers, while the remaining 103 might be looked upon as summer or autumn plants still flowering. The rainfall is inconsiderable throughout the Lothians, but the annual average is much greater in Mid than East Lothian. The average for nineteen years as shown at Inveresk is 19·68. As we advance westward the rainfall is greater, especially in the locality of the hills, where, oftentimes, a shower is experienced when the weather is beautifully fine in the low country. The annual mean rainfall in Edinburgh is 26 inches, but in the south and south-west districts it may be computed at 30 to 40 inches.

Geological Formation and Soils.

The geological features are well varied, and thus form an interesting field of research for those who delight in rock-exploring pastimes. To describe these fully would take a much larger space than we have at our disposal; nevertheless, as the rocks are closely associated with the surface soils, and, therefore, have a direct bearing upon the agriculture, a brief notice of the leading characteristics may not be deemed inappropriate. An extensive coalfield, of which Dalkeith forms the centre, pervades a considerable portion of the Lothians, and has for ages produced a large annual amount of this useful commodity for fuel. Extending through the whole of the south-east part of Mid-Lothian are the Lammermuir Hills, which belong to the Silurian formation, and consist almost entirely of *gneissic* rocks. The volcanic or igneous rocks are largely developed in this county, much of the fertility of the soil being due to the exten-

sive *beds* of these rocks which occur in the geological strata. The hill called Arthur's Seat, near Edinburgh, is thought to have been the site of an old volcano, and the supposition is quite borne out by the immediate surroundings. This is now, we believe, the theory generally accepted by experienced geologists. From Edinburgh *westward*, the carboniferous strata prevail extensively, forming the beautifully undulating country as far as Linlithgow on the western confines of West Lothian. Near this ancient town there occurs a vast series of sandstone and shales in frequent alternations. West Lothian is also rich in igneous rocks, which geologists have divided into three kinds, viz., volcanic ash or tufa, interspersed among the sandstone or shales; beds of greenstone; and trap dykes. The latest geological formation is known as drift, consisting of clay, sand, and gravel mixed with boulders and scattered over the surface. The drift theory is borne out by the grooves or markings which are found on the surface of the underlying rocks. These run from north-west to south-east, and were doubtless caused by the grating of boulders and sand frozen in icebergs, which were drifted from the north-west during the glacial periods. The fertile soils of the Lothians may, therefore, have been brought, in part at least, from the cold and barren shores of the Arctic Ocean, where the Greenlanders now yokes his faithful dog to the sledge, or the Esquimaux passes the dreary winter in his rudely-built snow-hut. It will thus be seen that the geological map requires to be used with great care, for the character of a farm cannot be inferred from the rocks upon which it lies. Notwithstanding this, it may be said generally that the fertile soils of Mid and West Lothian rest upon a rich geological basis, containing abundant supplies of coal, limestone, and building-stone. The surface soil along the coast varies much: sometimes in a limited area all classes, from bad to best, may be found. Some of the hills are moorish and mossy, others are covered with a thin clay, which, when well managed, produces crops abundantly. In the valleys principally, the most fertile subjects are to be found, while in the various river basins are some deep patches of loam. The north and mid sections of Edinburgh bear the palm in the quality of the soil, and have for ages reared a race of farmers and labourers which will bear favourable comparison with those of most districts in Great Britain. In the south and south-east the land is to a large extent pastoral, but for a long period, and especially in the past twenty-five years, the agriculturist has been encroaching on the "woolly peoples' wide domain." As already stated, about one-third of the entire county is now deemed as inaccessible to the plough; and, indeed, persevering capitalists and enterprising farmers may possibly yet reduce the proportion of unreclaimed or mountain land considerably, by driving this implement over

large beds of heath and barren pasture, which at one time were thought irreclaimable.

The county of West Lothian, though fairly rich in its agricultural capabilities, has nearly all varieties of soil. According to proximate calculations, about 20,000 acres are clay, either of coarse kind or otherwise of fine quality; 22,700 are clay, on a cold bottom 9500 are loam; 9500 are light gravel and sand; 14,000 are moorland and high rocky ground; 1500 are moss; and the remainder is occupied by a few patches of peculiar soils, lakes, and rivers. In Carriden parish the land is light and early, and is capable of producing good crops. It is scarcely possible to give a general character to the soils of Abercorn, so rapid and manifold are the changes which it undergoes. Sandstone, whinstone, limestone, and coal are extensively wrought, and add in no small degree to the wealth of the district. A better and more uniform subject prevails in Dalmeny, upon which thrive good crops of wheat, potatoes, and turnips, as also the luxuriant and picturesque plantations of the Earl of Rosebery. In the parish of Cramond there is some good land, in a high state of cultivation. Heavy-cropping soils are general throughout almost the entire parish of Duddingston. At the opening of last century it consisted of nothing but an unreclaimed moor, growing little but scrubby heath and the stunted juniper; now there are few, if any, foul spots to stain the agricultural picture. Eastward from the town of Linlithgow, a broad band of strong clayey land overlies the carboniferous system, and stretches to a considerable distance. It is fairly productive when well farmed, but somewhat difficult to work, and in ungenial seasons the crops are rather late. That portion of West Lothian lying to the south-west of the town of Bathgate has some good soil, but in the hilly districts it is much intermixed with patches of heath and moor. In the parish of Torphichen is also some wet moor towards the west, but the land under the plough is fertile and well cultivated. In this district the farming is necessarily of a mixed character, being partly pastoral, partly arable. In the Penicuik district, lying a few miles to the south of the city of Edinburgh, the surface is chiefly moorland, with moss and mountain pasture, but much has been reclaimed in twenty-five years. There is a considerable extent of wood in the locality. Coal and other minerals are found, but are not worked extensively. The population is somewhat sparse and scattered. Towards the south-east extremity of Mid-Lothian the land is hilly and not very favourable for tillage. The upper soil is only moderately fertile. It rests upon graywacke and clay slate. A considerable breadth of land in the Gala water district is entirely inaccessible to the plough, but the hills are covered with a short succulent herbage, well adapted for sheep. Of late years the moors have been much dried by the formation of sheep drains or open

cuts, particularly those portions where moss occurred. Large beds of limestone are found in the parish of Borthwick, and the land in general is of a hilly character. Some of the soil is thin and moorish, but a great part is well cultivated. Coming back more into the heart of the country, the surface around Dalkeith is beautifully undulating, and the soil, though somewhat light and patchy, rests upon a deep clay, and is highly adapted for the growth of fruit and forest trees. Around Corstorphine village a black loamy soil generally prevails, with traces of clay and sand. This district is literally, and has not inaptly, been termed "the garden of Edinburgh." The meadow ground in the vicinity is largely composed of decayed vegetables, and yields abundantly. Crichton parish possesses a fine, rich, deep soil, most of which is accessible to the plough, and brings forth good crops annually. The high lands are sheltered by belts of thriving plantation. The Fala and Soutra districts, in the eastern division of Mid-Lothian, contain some heath-clad hills covered with a thin gravelly soil, as also some marshy grounds. Fala-Flow is a large moss, extending to several hundreds of acres, from which a very large quantity of peats is annually dug. Among the Pentland and Lammermuir Hills are much moorland and moss, the farms in the neighbourhood being either wholly pastoral, or more commonly partly pastoral and partly arable. In these notes upon the soils of Edinburgh and Linlithgow, we might have given a much more elaborate and detailed account of what the farmers in each particular district have to work upon, but having fixed upon certain localities, embracing as nearly as possible every class of soil in the counties under consideration in order to illustrate our remarks, we think it is quite unnecessary to devote more space to the subject. In a future part of the paper, where the system of crop rotation pursued by several farmers is described, more details of the soils and their capabilities are brought under notice. We may, however, remark that, in general, there are few impediments to the plough, except where the land rises abruptly into mountain peaks of considerable altitude. Here and there boulders are found in the soil within reach of modern cultivation, but in the old reclaimed lands most of these have been removed, and are doing good service either upon the roads or in the drains. Very few of the soils are so thin as not to admit of a good furrow being taken, while they generally are of great depth, particularly where thorough culture has been practised during several rotations. In many instances subsoiling has been effectually carried out, thus affording a safeguard to the crops in wet weather, by allowing the rain to pass off more readily to the drains; and also being beneficial in dry weather, as a well-wrought subsoil is a retainer of moisture in the time of drought.

Rotation of Cropping.

The rotation of cropping varies much in both counties, depending upon the quality of the land, climate, and so on. Since the production of meat has become of paramount importance, there is even greater variation in the methods pursued than in former times, when corn and potato growing on a large scale were considered necessary in order to produce a satisfactory rent-roll. In some of the best farmed districts, the ordinary six-course shift still prevails, namely—

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| 1. Oats. | 4. Turnips. |
| 2. Potatoes, with part Beans. | 5. Barley. |
| 3. Wheat. | 6. Hay or Pasture. |

This rapid succession of grain crops is naturally very trying to the land, and in order to keep it in good order, the potato crop is invariably manured heavily. Many farmers are now strong in the belief that two years in pasture in the place of one would be preferable, as there would then be more grass in summer for stock. As it is, there is very little land devoted to pasturage; hence both the cattle and sheep stocking of many holdings in summer is reduced to a minimum quantity, while in winter it has to be considerably increased on account of consuming straw and the turnip crop. This importation of stock entails much risk from the introduction of disease, particularly when pleuro and foot-and-mouth are prevalent. As meat-making, rather than corn-growing, is now, or at least ought to be, the chief object of the farmer, it seems only reasonable to suppose that a larger extent in grass and a less breadth in corn would bring in the most profit. In some parts the rotation stands thus—

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|--------------------------|-------------|
| 1. Oats. | 4. Hay. |
| 2. Potatoes and Turnips. | 5. Pasture. |
| 3. Barley or Wheat. | |

This five-course shift is very common in some parts of Linlithgow, and is found to answer well where a part of the stock is reared upon the farm. Of course the breadth of potatoes grown on such holdings is not large, so that the green crop break is chiefly devoted to turnips for wintering cattle and sheep. Another six-course shift is—

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|-----------|-------------|
| 1. Oats. | 4. Turnips. |
| 2. Beans. | 5. Barley. |
| 3. Wheat. | 6. Grass. |

This is generally observed where the land is a strong clay, but on those portions where the soil is fairly free, grass is taken two years, making thus a seven-shift course. On a few holdings we find the four-course adopted, but this is not general. Indeed, glancing at the notes we took when making a tour through the counties, we find no less than six or seven courses which are

observed on different farms, so that a full account of the various rotations, and the reasons for their adoption given by the farmers who practise them, would swell out this Report to an undesirable length. We now proceed to notice each kind of crop in detail, with the mode of preparation, quantity of seed given, method of harvesting, and other matters connected therewith.

Grain Crops.

The total area under cereals of all kinds in 1875 amounted to 38,816 acres in Edinburgh, and 18,154 in Linlithgow. Good crops and fine samples are usually produced, and the aim of the farmer is generally directed to have the seed put down soon in the season, for he knows that an early sowing season is often the precursor of an early harvest, and this sometimes makes a difference between securing the grain well and only moderately well. Great discussion has lately taken place as to the desirability of the British farmer growing a much smaller area of grain than he now does, and increasing the production of meat as much as possible; and while this has been done to a certain extent as regards wheat, we do not know that the Lothian farmer could, with advantage, reduce his oat or barley crop very materially, as straw is needed for the winterage of cattle, bedding, &c. But this by the way. Harvest usually commences in the early districts from the beginning to the middle of August, being often a fortnight more backward in the hill country, where the climate is not so favourable, and the soil, as a rule, is thinner and less fertile. If anything, corn is cut before it is quite so ripe as it used to be when operated upon by the sickle. Wheat, particularly, is said to be finer in the sample when taken somewhat early, but, of course, moderation ought to be exercised in this as in other matters, for if cut much too soon, the grain becomes shrivelled when dry. Cutting is now mostly done by the reaping machine, although on very small farms, and in exceptional cases upon larger, the scythe is still used, and when the crops are laid or twisted, even the antiquated sickle is yet occasionally resorted to. Now and then we see small farmers work upon the reciprocity system, several joining in the purchase of a reaping-machine, the labourers moving from farm to farm as required. In most places, a few extra harvest hands can be obtained from other branches of local industry, and these, with the regular farm labourers, generally succeed in taking off the crop in two or three weeks. From eight to ten persons are required for each machine in addition to the driver and the man who puts off the sheaves. The harvest labourers work about ten hours per day, but sheafing is much easier work than hand-reaping used to be. A machine will cut about 6 to 8 acres in a day; some a little more, others a little less, according to weight of crop, whether it is favourable for

cutting, and the dexterity of the people employed. Although harvesters in general bewailed the introduction of reaping-machines, which they declared took the bread from their mouths, yet it cannot be denied, even by those sons of industry, that they have been of great benefit to the farmer. In former times, when the corn crops ripened in rapid sequence, or rather perhaps simultaneously, the utmost difficulty was experienced in getting them cut before they were so ripe as to lose much grain by shedding. More corn by far was also injured by exposure to weather, as before the last parcels were cut and carried, the season was quite advanced, stormy weather frequently set in, and the wind-up of the harvest was rendered slow, tedious, and expensive. By the use of machines two to three weeks of average weather should see the grain all cut; in ten days more it ought to be carried. It is a noticeable fact that, contemporary with the introduction of the reaping-machine, the weather during harvest has become much more fickle and less to be depended upon. Were harvest now, as in days of yore, to continue eight or nine weeks, the chances of securing the grain in anything like fair condition would be considerably lessened. Kemp, Murray, and Nicholson's (Stirling), with Jack & Sons' (Maybole) machines are most extensively used in the Lothians. In Edinburgh, harvest hands are somewhat high, owing to a gradual and growing scarcity of labourers, best men being paid 3s. 9d. to 4s. 3d. per day, with food for a month or sometimes longer. Women are paid 3s. to 3s. 6d. per day, and the ordinary farm hands have a month's meat in addition to their regular wages. In the hill districts, rates are a little lower, as the season is more advanced before harvest commences, and the demand for extra hands is consequently not so great. The cereal crop is carted with all despatch when it is once dry, as the Lothian farmer never believes that his grain is safe until it is under "thack and rape." Round stacks are usually built and dressed with as much care as if they had to stay for several years rather than so many months. The wheat stacks that have to stand over-year are mostly built upon pillars, to secure them from vermin. Fires are not very common in the Lothians, but it is a safe plan to insure the crop, as a spark from a cottage or passing train is sufficient to deprive the farmer of his whole year's crop.

Wheat.—The counties were more noted for the production of wheat a few years ago than they now are. Still, with less than one-half of the land cultivated than in Ayr, Edinburgh has a similar area of this cereal; but Haddington, with 20,000 acres less land under cultivation, has twice the acreage. In Linlithgow comparatively little ground is sown with wheat—scarcely one-thirtieth of the land under the plough. The annexed table shows the acreage in

Year.	Edinburgh.	Linlithgow.	Year.	Edinburgh.	Linlithgow.
1856,	11,628	4,643	1870,	5,935	2,495
1857,	10,037	3,737	1871,	6,582	2,569
1866,	6,241	2,582	1872,	6,217	2,622
1867,	5,951	2,059	1873,	5,265	1,641
1868,	6,814	2,816	1874,	5,916	1,914
1869,	7,285	2,755	1875,	5,240	1,864

A glance at the above shows that less than one-half of the area of land is devoted to wheat than was twenty years ago. This may partly be accounted for by the comparatively low market price of this commodity with other productions of the farm, the value of wheat being much affected by the importation from foreign parts. For example, within the time named, butchers' meat has been doubled, while value in wheat has remained almost stationary. A very small proportion of the crop is taken after naked or bare fallow, the area of which is year by year becoming "small and beautifully less." Wheat is rarely taken after grass, being almost invariably sown after roots or beans. Farmers generally contrive to get as much seed in as possible from the middle of October to the end of December, but sometimes a little is left over till the spring. Both broadcast and drill sowing are practised. Where the land is clean the former method is perhaps preferable, as the roots of the plants, not being so confined as they are in the drills, tiller better. On stiff clays, too, the broadcast system is to be recommended, but on fine free-working soils drilling is preferable, as the crop is more certain, there being less liability of the plants dying out in winter, owing to want of firmness in the soil. Another point crops up which is of manifest importance had we time to dwell upon it—the best width between the drills. What this should be is by no means decided, nor is it likely to be, because of the varying circumstances of soil, locality, and climate; yet we have it on good authority that wide drilling almost compels clean farming, as the hand and horse hoe have to be kept pretty regularly at work in order to keep down the weeds. But close-drilling also has its advocates, and when doctors differ, who can decide? For drilling at intervals of 8 inches, from 2 to 2½ bushels in autumn to 3 in spring are about the quantities used, from 1½ to 2 pecks additional being allowed for broadcasting. Before sowing, the wheat is steeped in a solution of blue vitriol, at the rate of about 1½ lb. to each quarter of grain, as a remedy against ball and smut. Many varieties of wheat are grown. Of these we may mention Fenton, Hunter, and Shirreff's King Richard, the latter of which is an excellent cropper. Chedham and Trump are also cultivated to some extent. In the red varieties, Square Head has attained to some celebrity, while Spalding and Browick have their admirers. The estimated

average produce of wheat in Edinburgh is 31 bushels per acre in the best districts, and 24 to 25 in the higher, although many crops exceed these figures by 12 or 15 bushels, and some by a great deal more. In Linlithgow, 30 bushels is stated as the average, but from $4\frac{1}{2}$ to $5\frac{1}{2}$ quarters is often reached.

The usual weight of wheat may be set down approximately at 60 to 63 lbs. per bushel; on good soils a little more, on poor thin subjects something less. Weeding of cereals is not so much attended to in the Lothians as it might be. It is, therefore, not uncommon at certain times to see the fields yellow with the flowers of the wild mustard; at others, red with those of the poppy. Wild oats, too, are a serious source of annoyance in some districts, while thistles spring up luxuriantly in soils favourable to their growth. Top-dressing of wheat is practised here and there. When fertilisers thus applied are mixed with potash and common salt, the straw becomes much stiffer, and thus root-falling and stem-rotting are, to a certain extent, prevented. In adverse seasons the larvæ of the crane-fly or daddy-long-legs (*Tipula oleracea*) occasion much mischief to the roots of the plants; small insects sometimes attack the stem, while the ear is now and then injured by the wheat midge.

Barley.—In both Mid and West Lothian a comparatively large area of barley is grown, being in each county almost one-eleventh of the breadth under cropping. The acreage under barley was in—

Year.	Edinburgh.	Linlithgow.	Year.	Edinburgh.	Linlithgow.
1856,	10,123	3,789	1870,	12,467	5,001
1857,	11,810	4,653	1871,	12,483	4,955
1866,	10,362	4,205	1872,	12,982	4,767
1867,	10,619	4,239	1873,	12,377	5,293
1868,	10,404	3,884	1874,	11,686	4,899
1869,	11,530	4,334	1875,	12,212	5,158

Of late years a slight increase is noticeable in the extent under cultivation, but not nearly so much as in some counties. The fluctuations in the statistics effected by the growth of this cereal in the past twenty years have been very trifling, although prices have varied considerably. Compared with wheat, the value of barley now stands relatively high; this is, without doubt, one reason why the area under the latter is so well maintained. On farms near the sea fine crops are annually grown, as also on the lighter soils in the interior of the county. Barley is generally taken after turnips. As the crop draws its constituents from the soil very quickly, unlike wheat, which takes them gradually, it is necessary to have the land manurially rich, for the plant sends out numerous roots which spread laterally through the soil. Where the whole of the turnip crop has been drawn, farm-yard, or artificial manures are substituted, but the

barley crop is rarely as good as it is after the consumption of the turnips upon the land. The condition of the "bed" in the time of seeding is of primary importance. The best state of the soil is a friable one, so much so that when sowing the seed, in the language of the old adage, "the dust should rise above the harrows." Still there should be, at the same time, a sufficiency of moisture in order to germinate the grain and give the plants a start. With these conditions of soil, early sowing answers best, for it is usually productive of the largest bulk of straw and the heaviest grain yield. Both broadcast and drill sowing are practised. While there are undoubtedly great advantages to be derived from the former, which in some respects suits the habits of the plants very well, the great difficulty is to secure that uniformity of depth which alone gives, or at all events gives best, the uniformity in the sample so desirable in the barley crop. If sown broadcast, about 12 pecks per acre are allowed; if by drill, 8 to 9 are considered sufficient. On account of its productiveness and the preference shown to it by maltsters, Chevalier still seems to be the favourite variety, but on high-lying farms much common barley is also grown. Annat and Golden Drop also have their patrons, but these descriptions do not yield so well as Chevalier. Moreover, where the soil is manurially rich, the latter is least liable to lodge, and when it does fall it is not at all subject to send out lateral germs or shoots. Full crops yield 56 to 60 bushels per acre, but this quantity is not often reached. A fair return for Edinburgh may be stated at 42 to 48 bushels per acre, and 40 to 46 in Linlithgow. The weight of best samples reaches 56 or even 57 lbs. per bushel, but a good average may be estimated at 54 or 55 lbs.

Oats.—The oat crop in Edinburgh covers a similar area to that occupied by the same crop in Argyll and Moray, Linlithgow having about half the extent. The acreage was in—

Year.	Edinburgh.	Linlithgow.	Year.	Edinburgh.	Linlithgow.
1856,	23,181	12,520	1870,	22,157	10,542
1857,	22,029	11,990	1871,	22,013	10,374
1866,	22,866	11,224	1872,	21,158	10,576
1867,	21,804	11,249	1873,	21,720	10,302
1868,	22,010	11,255	1874,	21,514	9,728
1869,	21,979	10,503	1875,	20,809	10,101

It appears from these statistics that the land devoted to the oat crop in both counties has decreased somewhat in twenty years, but has varied very little in the past ten years. It is almost the invariable practice to take oats after lea, the exception being here and there a patch of potatoes which are taken from the lea furrow, or on the high farms a crop of oats taken after roots. Some farmers plough their land early; others leave it until after the stubble has been turned over. Early ploughing,

to the depth of 6 or 8 inches, generally gives the best results, as the turf is deep enough, and has sufficient time to decay, and act as a fertiliser to the young plants. The surface, too, becomes mellowed by the winter frosts and rains, and a good seed-bed is ensured. The condition of the soil for the oat plant is a deep and well-stirred one, the subsoil being free from stagnant moisture. In habits of growth, oats resemble wheat more than barley, inasmuch as the roots, or rootlets, push themselves vertically into the soil rather than laterally near the surface. In the matter of sowing, a part is done with the drill, but it is not always either convenient or expedient to do so. A saving of seed is effected, and where hand-hoeing is practised, it is undoubtedly the best plan. Sown broadcast, about $2\frac{1}{2}$ to 3 bushels of seed per acre are used; often a great deal more. Indeed, it is a fault that the Scotch farmers have of scattering far too much oats upon the ground. When the seed-time is favourable, and the seed good, the mistake of thick sowing is manifest. Many fields are one-fourth too thickly planted. Four bushels sown by hand, and 2 or 3 by the machine, must be considered as ample. On the early holdings, seeding commences with the advent of March, but towards the hills it is well on to the end of the month, and now and then into April before the crop is entirely got in. Two double turns with the harrows generally suffice to cover the seed, but of late farmers have shown a preference in finishing with the chain harrow. Several varieties of oats are grown in both counties. The popular sorts seem to be the Potato, Sandy, Hopetoun, Longfellow, Tartarian, Gray, and Early Angus. On deep soils, manurially rich, the Potato yields well, while upon moderately-conditioned lands the Sandy is a very suitable variety. The Black Tartarian is a prolific cropper when sown upon a deep rich soil, often yielding as much as 7 to 9 quarters per acre, weighing 35 to 38 or even 40 lbs. per bushel. A fairly good crop of Potato oats in Edinburgh may be stated at 45 to 50 bushels; in Linlithgow, 40 to 45 bushels. Certainly these figures are often exceeded, while in many cases they are not reached, so that stating an average yield is at best only a hazardous conjecture. The weight per bushel varies from 40 to 43 lbs., or about 41 lbs. on the average. No cereals benefit more from top-dressing than oats, but since the more extensive use of extraneous feeding stuffs for stock, less top-dressing has been required and given. When found necessary, a mixture, consisting of $1\frac{1}{2}$ cwt. of guano with 1 cwt. of nitrate of soda and 1 cwt. of common salt, has a most salutary effect on the crop, particularly if applied in showery weather. Moreover, the salt acts, to a certain extent, as a specific against grub and other insect pests, so that its virtues for agricultural purposes can hardly be over-estimated.

Beans.—A very small breadth is annually devoted to beans.

In 1866 it was 802 acres in Mid-Lothian, but by 1875 the area had been reduced to 467 acres. In Linlithgow, for the same years, the acreage was 1029 and 1026—a very small difference in ten years. In the latter county the crop is sometimes a very good one, the returns being ample and satisfactory. A firm consolidated soil is best for the bean crop, the tilth being such that the plants can send their rootlets a long way down into it. If lime is not present, it is generally added, as it is an essential element in the constitution of the bean crop. Both the drill and broadcast systems of sowing are common, but the former mostly prevails, and is undoubtedly the best. A width of from 16 to 24 inches between the drills allows of the plants being thoroughly cleaned, and is therefore considered the most convenient. The bean crop reaches from 32 to 36 bushels per acre on the average: when these figures are exceeded, the return is thought good.

Rye and Peas.—Very little land is occupied by these crops in either county, being confined to a few acres in small patches. As the produce affects the agriculture in a trifling degree, it would be a waste of time to enter into details of quantities and methods of cultivation. We may note, however, that in 1875 there were in both counties 52 acres of rye and 41 of peas in the aggregate.

Hay and Grass.

Within the past ten years a much larger breadth has been annually devoted to sown grasses. The acreage was in—

Year.	Edinburgh.	Linlithgow.	Year.	Edinburgh.	Linlithgow.
1866,	26,907	11,519	1871,	29,369	13,163
1867,	27,967	11,975	1872,	29,464	13,555
1868,	28,295	12,114	1873,	30,670	14,095
1869,	25,241	10,463	1874,	32,045	16,325
1870,	30,982	14,471	1875,	33,139	17,477

The grass seeds are generally sown along with the barley crop, which is the last in the rotation; now and then this plan is deviated from, but seldom. When barley has been put down early, the grass seeds are sown after it has braided, because, if they are put in at the same time, they get too profuse by harvest time, and cause great difficulty in securing the drying of the sheaves for the stack. In a favourable season, sowing commences by the middle of April. The seed is now almost universally deposited by a drill, 16 to 18 feet wide, and covered in either by a very light stroke of the harrows or by a turn with the roller. The latter plan is mainly adopted, and is to be recommended, because the nearer small seeds are to the surface the better. Throughout both counties farmers hold various opinions as to the quantity of seeds requisite to produce a full and close sole of grass. Mr Anderson, of Norton Mains,

sows 10 lbs. of mixed clovers with $1\frac{1}{4}$ bushel of ryegrass—one-half home grown, that is British, and one-half foreign. This quantity is found to answer well upon his farm. Mr Wilson, Lochend House, Linlithgow, sows 8 to 10 lbs. of mixed clovers with 5 or 6 pecks of perennial ryegrass. Both quantities are often exceeded on other farms. A good mixture for pasture land is 8 lbs. white clover, 5 or 6 lbs. of red, 2 lbs. of alsyke, with 6 pecks of mixed ryegrass. A little cowgrass and trefoil added will be an improvement. For hay, 10 lbs. of red clover, 4 lbs. of white, 2 lbs. of alsyke, 3 pecks of perennial ryegrass, and 3 pecks of Italian is a mixture which is found to answer well. Farmers have discovered that in the matter of seeding with grasses it is a wise maxim to err on the safe side, and so secure a thickly-set sole or sward. We made several inquiries as to clover sickness; it is experienced in some cases, and is undoubtedly owing to want of potash.* A good dressing would be highly beneficial to many of the soils. In Edinburgh, about two-thirds of the grasses under rotation are made into hay or cut green for cattle; the remainder is grazed by stock. In the neighbourhood of the city, a considerable quantity is annually cut and consumed in the city byres and stables. A large area is let every year for the purpose at high rates. This year (1876), clovers and artificial grasses for cutting made L.19 to L.20 per acre, but in times of scarcity we have heard of L.30 being reached. In Linlithgow about three-fifths of the entire crop is made into hay. There is a very small acreage of permanent meadow-land reserved for this purpose, amounting only to 1300 acres in Edinburgh and 718 in Linlithgow. Towards the end of June, or as soon as most of the flowers are in bloom, cutting of the grasses for the hay crop commences. This is now almost entirely done by the mowing machine, although the scythe is still employed on small holdings or where the crops are much weather beaten. When seed is not intended to be taken, early cutting is deemed most desirable, as the farmers are fully alive to the fact that the hay is more valuable, and the after-crop heavier. The best time to harvest clover is a little before the period of full blossom; if allowed to stand longer the stalks partake too much of the woody fibre; if taken before, the juices are not properly formed. But the time of cutting seems to be much better understood than the making of the hay after it is cut, for although the Lothian farmers are abreast of those in many other parts of Scotland in the matter of hay-making, nevertheless, almost all of them allow the grass to lie too long in the swathe. A day or two is sufficient, with careful management, to get it ready for large cock, after which it is better to

* We may here remark that a friend of ours applies kainit or potash salts where the land was formerly clover-sick; now he raises splendid crops of clovers which are never thrown out in the winter months, as they were before potash was used.

cart it to the stacks at once than to cole it in the fields, because this system entails great waste. In hay-making the Scotch farmers might advantageously take a lesson from their English brethren, who delight in having their hay green, crisp, and aromatic. To make a good article, it should be done quickly, so that the juices may all be retained. In order to secure a full aftermath, some leading farmers are now in the habit of top-dressing with a light application of nitrate of soda and dissolved bones; others use 2 cwt. of Peruvian guano. A mixture of Peruvian guano, nitrate, and common salt in equal proportions, and applied at the rate of 3 to 4 cwt. per acre, has been tried with good results. In the neighbourhood of Edinburgh, the foggage, so forced, is sometimes cut for stall feeding, and in a dripping season the yield is large. The permanent land devoted to the production of hay has been vastly improved in recent years by draining and surface dressing with compost, but there are many portions susceptible of still further improvement. Unless full compensation be made, the scythe is the greatest robber that comes upon a farm. As a rule, the land which is grazed the second year carries a fair head of stock, but grazing on a large scale has not yet drifted in to be one of the branches of farm management observed by the Lothian occupier.

Any report on grasses produced in the county of Mid-Lothian would be incomplete without a brief notice of the sewage farming carried on at Edinburgh, by which as much as L.45 per acre has been realised from what was originally the poorest of soil. The extent of these forced meadows is at present about 400 acres, and it is gradually increasing. The whole is irrigated with the sewage of Edinburgh, and as it is free of charge, and there is little expense connected with it, through the elevation whence the fluid manurial ingredient comes being some 300 feet above, the farming is very profitable.

At Craigentenny, between Edinburgh and the sea, are the most extensive meadows in Scotland, being about 200 acres, all of which have been under regular irrigation with sewage for upwards of thirty years. A large variety of seeds was put in at the outset, the principal being Italian rye-grass. Most of the sown grasses have disappeared long ago, but in their place has gradually sprung up abundance of natural grasses, which now form a close thick sole. The produce is sold each year, chiefly to cow-keepers, at L.16 to L.28 per acre, and one year the price reached L.44. The crop is cut five times in the season, from the beginning of April to the end of October. The annual proceeds of the farm, which is in the hands of Mr Christie, the owner, amount to between L.3000 and L.4000, the expenditure being merely the wages paid to two men for keeping the ditches in proper order. The gross produce per acre is estimated at 50 to 70 tons.

A little nearer the city are the Lochend meadows, tenanted by Mr Scott, Duddingston. They have been laid out on the ditch system, which involves a little more expense, but still they pay well. In all, they extend to about 80 acres, most of which is in grass, but on an arable plot of 12 acres, potatoes are sometimes grown, the land being sown with Italian rye-grass after their removal, which comes in for cutting before winter. The second crop brings about L.5 per acre. The permanent grass has averaged during nine spring sales L.27, 12s. per acre; prices ranging from L.20 to L.45, according to crop and demand.

At Dalry, on the west, Mr Thomson has about 70 acres under sewage irrigation. These meadows have been in grass for at least half a century, and possess a thick well-set sward. The sewage has ample natural fall, and involves little expense. The produce is disposed of in a similar manner to that on the farms already described.

At Grange, on the south, a plot consisting of 16 acres gets the drainage of a small section of the city. Altogether, the sewage irrigation of Edinburgh has been a great success, the produce being worth at least L.6000 per annum. This is, as already stated, principally grass, which is mostly consumed by the 2000 dairy cattle estimated to be in the district. Much has been said and written anent the suitability of sewage grass for dairy cattle, and while we do not intend here to enter into the *pros* and *cons* which have from time to time been advanced, we may remark that the cow-feeders of Edinburgh acknowledge it to be a valuable milk-producing commodity, and that they can get no other feeding stuff to compare with it for the same amount of cash, notwithstanding the high prices they have to pay per acre.

Green Crops.

Turnips.—About one-tenth of the cultivated area of Edinburgh and one-fifteenth of Linlithgow are annually under turnips. This is a much higher percentage than the turnip area occupies in many counties, but vastly inferior to Aberdeen and some other important cattle-feeding districts. The extent was in—

Year.	Edinburgh.	Linlithgow.	Year.	Edinburgh.	Linlithgow.
1856,	14,517	5,142	1870,	13,853	4,645
1857,	15,274	5,246	1871,	13,513	4,763
1866,	13,629	5,226	1872,	13,759	4,510
1867,	13,660	5,262	1873,	13,943	4,486
1868,	13,859	5,141	1874,	13,287	4,408
1869,	13,983	4,782	1875,	13,022	4,417

In both Mid and West Lothian there has been a gradual reduction in the area during the past twenty years, though not to any appreciable extent. On all the soils where turnip culture is suitable, it is still considered the mainstay of arable and mixed

farming, providing, as it does, such a large amount of winter food for stock, and its consumption being so valuable a manurial agency for corn. Where autumn cultivation is observed, the land is ploughed with a deep furrow of eight to ten inches as soon as possible in the fall. It is then allowed to lie till the following spring, when it is well grubbed, spring ploughing being rarely practised. A few years ago, as many as two furrows were given in spring, but this mode of culture has been almost abandoned, inasmuch as it not only entails more labour, but is positively mischievous in its effects, for the rainfall being moderate, the soil becomes dry and hard, so that a fine tilth is difficult to obtain, and there is a lack of moisture to promote the germination of the seed. Two or three good grubblings generally suffice, the last being generally made in the direction of the drills. Mr Davidson, Walton, approves of autumn cultivation, and he rarely ploughs in the spring. Mr Anderson, Norton Mains, also thinks that autumn ploughing and spring grubbing answer best. Mr Melvin, Bonnington, ploughs in autumn, taking a deep furrow, and grubs in spring, obtaining a fine tilth. Mr Inch, Liberton West Mains, has grubbed regularly in spring for thirty years, going over the land once, twice, or thrice, as may be found necessary. The practice never fails with him, as he gets his land into good order and retains all the moisture in the soil. Another successful agriculturist, Mr Dickson, Saughton Mains, also prefers spring grubbing, as he gets a finer mould and a better braird of plants. We have brought forward these examples in order to show the general esteem in which spring grubbing is held by many of the successful farmers in the Lothians. Mr Mylne, Niddrie Mains, on the other hand, advocates spring ploughing for turnips, but he works well up to the plough with the harrow and crusher, so as to retain the moisture. Drills are generally made 27 inches in width with a double-mould plough. Where farm-yard manure is used, it is forked into the stitches, if not previously applied to the stubble in autumn, and the drills split to cover it in. From 2 to 3 cwt. of portable manures is also allowed to give the plants a start at the outset. Where artificial manures are used alone, about 8 cwts. of mixed guano and phosphates are generally given in the proportion of 6 of the former to 2 of the latter. Of late years, farmers have seen the necessity of sowing a larger proportion of swedes than formerly, as they keep so much better than the softer varieties during a severe winter. The sowing of swedes commences in the second week of May, weather permitting, and is finished before the end of the month, the white and hybrid descriptions being sown immediately after, and the whole crop being got in, if possible, before midsummer. Occasionally, the turnip beetle—*Haltica nemorum*—proves very destructive when the plants are in the

cotyledonous stage, and, as a safeguard, a heavy seeding is given, from 3 to 3½, or even 4 lbs. per acre being the usual quantity sown. Many farmers, however, consider that 2½ lbs. of fresh home-grown seed is quite sufficient. And here we may note that selection of seed is, or ought to be, a very important matter with the grower. Having faith in the adage that "like begets like," he should satisfy himself, not only that his seed is descended from a healthy and trustworthy stock, but also that the bulbs from which it was produced had been carefully selected and transplanted. Seed grown from a miscellaneous crop of bulbs can never be so good as that produced from those which have been selected for their shape, size, and general qualities, because roots of all kinds are liable to deteriorate, unless much care be exercised in their propagation. The varieties of swedes grown are Skirving's, East Lothian, and purple-top; of common turnips, the white globe, greystone, yellow bullock, and Fosterton hybrid. In singling, the roots are left 10 to 12 inches apart, as a rule, although we have seen many fields where the plants were much nearer, scarcely exceeding 6 or 7 inches. Singlers, unless well looked after, are apt to leave the plants too close together, as few of them can realise the size of a well-developed turnip when they see it only in its infant stages. Still, great care is often exercised in the singling, in order that no two plants may be left in close contact, as the growth of both is then abnormal. Hand-hoeing and weeding, with stitch-harrowing and grubbing, are vigorously prosecuted, with the view of keeping down weeds and stirring the soil, so as to allow the air to permeate it until the plants close in the drills and entirely preclude further operations. We may mention that a few farmers have latterly tried the top-dressing of turnips with a mixture of superphosphate and nitrate of soda applied broadcast immediately after singling. This is found to have a beneficial effect upon the plants, and the practice is worthy of being more generally adopted. About 16 to 18 tons of swedes, and 22 to 23 tons of common turnips per acre, may be put down as a good average return from first-class land, but the average of both counties on all classes of soil will probably not over-reach 16 to 17 tons. The proper storing of turnips is not so well attended to as it might be, neither in the Lothians nor in many other districts of Scotland. Too often they are carted from the fields during the winter as they are required, and in the event of a snow storm occurring or a hard frost setting in, there is a great waste experienced in this "hand to mouth" system. By the latter part of October, or, say up to the middle of November, the roots should be topped and tailed, and carted to the homestead, or in some way protected from the winter storms. When carted, the roots should be free from frost or rime, or their keeping qualities will be impaired. There are several methods

of storing turnips observed. The old-fashioned plan of putting in longitudinal heaps and thatching with straw has in many instances been superseded by what we think is a better method—that of storing in square heaps, having a uniform depth of three feet. These heaps are finally covered with straw, and the bulbs keep admirably, the rain running through without doing any harm. Another plan is to cart the roots to a piece of clean lea, and set them closely together upon the turf, the tops serving for a protection. Where it is intended to consume the crop by sheep upon the land during spring-time, turnips are sometimes put in heaps as most convenient, and covered with straw and earth; or four rows are thrown into a drill, and a deep furrow drawn up each side, the soil being laid close to the roots. In consuming the turnip crop, the farmer has to consider two points—the making of the straw at home into manure, and the enriching of the land for the future wheat or barley crop. In order to provide for both these important matters, four drills are usually drawn off to consume with the straw in the cattle folds, the remaining four being eaten upon the land by sheep. This practice leaves the soil in high manurial condition, especially if a little cake has been allowed with the turnips. Some farmers let their roots for consumption, the rate per week for aged sheep being 6d. less or more, according to supply and demand. One penny per day is reckoned a very good price: if the crop is heavy, it ensures a remunerative return. When let for cattle, the general rate is 4s. or 5s. per week, or about L.8 to L.9 per acre. Should the purchaser desire to consume cake along with the turnips, of course the farmer gets the benefit in the improved manure; for this cake he gives an equivalent in money at the rate of L.2 to L.3 per ton. The city dairymen buy a considerable quantity of turnips from the farmers near Edinburgh, for which they pay heavy prices.

Potatoes.—In each of the counties under consideration the potato crop covers about half the extent that is allotted to turnips, so that the apportionment of the green crop, with trifling exceptions, is one-third potatoes, two-thirds turnips. Edinburgh stands in the eleventh position as regards other counties, while Linlithgow, owing to its limited area, holds an inferior position. The breadth was in—

Year.	Edinburgh.	Linlithgow.	Year.	Edinburgh.	Linlithgow.
1856,	6,668	2,044	1870,	7,427	2,523
1857,	5,801	1,666	1871,	7,939	2,626
1866,	6,358	2,076	1872,	7,473	2,661
1867,	6,475	2,216	1873,	6,072	2,088
1868,	6,988	2,307	1874,	6,638	2,290
1869,	7,580	2,461	1875,	6,476	2,311

The extent of land under potatoes remains much the same as it was twenty years ago. The soil and climate are generally favourable to the growth of this esculent, and a good yield

is the rule. But the crop hardly pays so well as formerly, owing to the demand for Scotch potatoes not being so keen in the London markets. Sales are, therefore, scarcely so easy to make, while prices are less than they were twenty years ago. Potatoes form the second crop in the rotation, occupying a portion of the oat stubble, which is almost always manured in the autumn. A few farmers, however, adhere to the drill-manuring system, inasmuch as they maintain that the crop is larger. Though we are ready to admit this, yet it cannot be denied that autumn manuring gives sounder tubers and better quality, while the labour in spring is reduced to a minimum. Where fall manuring is practised, as soon after harvest as is convenient, the land apportioned to this crop is divided by furrows drawn at a distance of 18 feet apart, in order that the manure may be regularly and evenly laid on. The quantity per acre varies, but it is well known that it is poor economy to give less than experience has proved necessary to the production of a full crop. From 20 to 25 tons is reckoned a good dressing, but even this quantity is, in some cases, much exceeded. For example, in the present season (1876), we saw a fine thirty-acre field of potatoes upon the farm of Mr Anderson, Norton Mains, which had been dressed with 1250 tons of well-made farm-yard manure, or between 42 and 43 tons per acre, allowance being made for hedges and headlands. Besides this, the crop was dressed with 4 cwt. of guano, at a cost of 10s. per cwt., one-half being applied at the time of planting, the remainder as a top-dressing. The potatoes were taken after grass, but the practice is not general. After the land has been manured in autumn, it is ploughed with a deep furrow, and where free from weeds little more is needed in the spring than a few stripes with the grubber and going over two or three times with the harrow. Sometimes potatoes are grown solely with portable manures, chiefly guano and dissolved bones; in such cases, 16 to 18 cwt. are given, at a cost of L.8 or L.9 per acre. After the land has got into a nice surface tilth, it is thrown into drills about 27 inches wide. The artificial manures are then applied and the potatoes planted. Ten inches is a common width between the setts, but a few growers prefer twelve; others, fourteen for the late descriptions. Dalmahoy's and Red-hogs are the chief croppers in the early varieties, Regents and Rocks in the late ones. Recently, Rintoul Dons and Victorias have been tried to some extent, while the old Orkney red, once so common, has almost entirely been supplanted. A wide opinion exists as to the best kind of setts to use. Some advocate those cut from large tubers; others prefer medium-sized potatoes planted entire, a small slice having previously been cut from the rose-end. Too many eyes in the seed are guarded against as much as possible, as they cause the haulms or shaws to be weak and the produce

small in size. The seed tubers are not cut long before they are wanted, inasmuch as the germinating powers are liable to be either impaired or entirely destroyed, by this procedure. A few weeks after planting, the drills are harrowed down to check the first or spring braird of weeds. When the potatoes are sufficiently through, a good hoeing is given, and between the drills the grubber and stitch-harrow are used as required. Previous to the final earthing up, which should always, if possible, be done when the soil is damp, many top-dress with 3 cwt. of artificial manure sown broadcast, which acts very beneficially in the formation of tubers. It will thus be seen that, independently of rent of land, cost of seed, working, and other incidental expenses, the potato crop is a very expensive one. In-purchased farm-yard manure costs about 8s. 6d. per ton, and before it can be laid on, generally entails 1s. 6d. more for carriage, thus bringing the price up to 10s. on application. A dressing of 20 tons at 10s., costs L.10; 4 cwt. of artificial at 10s., L.2; and, say 2 cwt. for top-dressing, L.1; making an aggregate manurial expenditure of L.13. This is only a low estimate, yet a very high figure. Still, as liberal manuring is essential to heavy cropping, there is no economy in limiting the supplies. Considerable losses are sometimes experienced from the crops being attacked by the malady which thirty years ago first created such wide-spread consternation throughout the British Islands. A fine crop in bygone times usually realised L.30 per acre when sold to dealers, but of late the prices have been much reduced. Ordinary value now rarely exceeds L.20 to L.25 per acre, sometimes less, so that, taking the risk of the crop and the expenses attending its culture into consideration, there is not a wide margin left for profit. An extra crop, however, still occasionally realises L.30 and upwards. A large proportion of the tubers grown in both Edinburgh and Linlithgow are sold to dealers who reside in Dunbar. The crop is lifted solely at the buyer's expense, the farmer furnishing the horse work only. These dealers carry on an extensive trade, some of them buying as far as L.20,000 worth in a single season. Lifting commences with the Dalmahoy about the beginning of July, or sometimes in the latter part of June. These are sent off to Edinburgh and other towns in baskets, where they command a good price. A few farmers pit all their later varieties in preference to selling to dealers, consigning to London or disposing of as best they can throughout the winter and spring. In October the general crop is lifted and stored, the whole being finished before Martinmas. The raising of the tubers entails a heavy expenditure. One practice is to throw them out with a plough specially constructed; another is to raise by the digger, but this implement is not yet in general use; while, perhaps, the most satisfactory method adopted is

hand-digging. The potatoes are stored in pits, thatched with straw, and covered with nine inches to one foot of soil. From 7 to 8 tons per acre is thought a good crop, but the prolific varieties occasionally reach 9 tons. The tubers are sorted into three divisions, the largest size being for the table, the second for seed, and the smallest for stock or the starch manufactories. Large quantities of seed are sent to England, the change from the Lothians being a good one; while the seed required in turn is purchased every year, or every alternate year at furthest, from Perth, Lanark, and the adjoining counties, the aim being to obtain them from a later to an earlier and better district.

Other Green Crops.—In Mid-Lothian, 657 acres of cabbage and 968 of vetches were grown in 1875. These form a valuable food for dairy stock, as both crops come in at seasons when other substances are scarce. Seventeen acres of mangolds and 53 of carrots were also raised. The latter are sometimes used for horses, but a large portion of them goes to the Edinburgh green market. In the same year, Linlithgow had 307 acres under vetches, 72 under cabbages, 18 under mangold, and 1 under carrots.

Live Stock.

Cattle.—There are comparatively few cattle bred in Mid-Lothian, but a larger proportion in Linlithgow, although breeding is carried on not nearly so extensively as in many counties of Scotland. In Aberdeen, Berwick, Caithness, Moray, and Kincardine, for example, one-half of the entire number of cattle collected by the Board of Trade are under two years of age, while in Edinburgh only one-fourth, and in Linlithgow one-third, are under two years; and were the statistics collected at Christmas in place of midsummer, the proportion would still be much smaller. Breeding is chiefly carried on upon farms remote from the large towns, and on the upland holdings, where nearly all kinds of farming are now and then observed by one tenant. Often the calves from the large dairies are purchased by hill farmers, reared, and sold off fat. Feeding cattle are generally good crosses bought in at the autumn fairs, and disposed of during the next summer. The farmers near Edinburgh have great facilities for the disposal of dairy produce, hence the dairying interest receives a large amount of attention. The number of cattle was in—

Year.	Edinburgh.	Linlithgow.	Year.	Edinburgh.	Linlithgow.
1866,	13,013	8,029	1871,	17,633	11,563
1867,	15,389	10,443	1872,	19,001	11,635
1868,	16,031	10,762	1873,	18,465	11,922
1869,	15,783	10,181	1874,	18,404	12,033
1870,	15,299	10,770	1875,	19,004	11,543

There has been a large increase in the number of cattle kept within ten years, amounting to nearly 50 per cent. in Edinburgh,

and very little less in Linlithgow. This has been brought about principally by the low rate at which grain has been selling, and the improved price of butchers' meat, combining to make the farmer change his system of management. The reduction in the area of wheat land has therefore seen a corresponding increase in the head of cattle kept—a noticeable feature in almost every part of the kingdom.

Breeding and Rearing of Cattle.—The total number of young cattle in Edinburgh in 1875 was 5412; in Linlithgow, 3851. These include all cattle under two years old, so that the number of calves annually reared cannot be large. They are generally born in spring, although in the vicinity of the dairies there is a fair proportion dropped in the fall of the year, the cows being destined to fill the ranks of the cattle which have become dry, and are put up for feeding. Spring calves get the mother's milk for a month at the commencement; they are then put upon skim milk, to which is added a little gruel, or, in some cases, artificial food. Different systems prevail in the after-management. Some prefer to turn the calves upon the pastures, giving them skim milk twice a day; others keep them under cover, and allow them grass or tares. We noticed that where it is the custom to drive milk to the towns, the calves were in poor condition, the immediate money return being most in favour. However desirable, therefore, it is in some respects that dairy farmers should rear their own cattle, this is one disadvantage of the system, for if the calf-flesh is lost, the animals are liable to be stunted in after-life. Winter calves get new milk for a month or six weeks; they are then put upon skim milk or gruel. In addition to this, they have sliced turnips as soon as they can eat them, with a little hay. Cooked food is seldom given, the majority of farmers having a decided objection to it, but several have great faith in pulped roots. The method of rearing differs so little from that pursued in other counties that we have little to add on this point, but, by way of illustration, may give the practice of two or three farmers in the breeding districts. Mr Meikle, Seafield, Bathgate, who owns one of the best pure-bred Ayrshire stocks in Scotland, rears 20 to 30 calves annually, giving them warm milk from the cow for a month, after which they are run upon the pastures, and are fed with skim milk and artificial food. Mr James Mackay, West Craigs, raises 20 cross shorthorn and Ayrshire calves, giving new milk for a month or five weeks, and afterwards skim milk. These crosses he keeps two and a half years, selling off fat from October to Christmas. Mr Archibald M'Vicar, Woodend, Torphichen, brings up 15 to 20 calves to consume the milk from a dairy of 12 to 15 cows. This is principally a hill farm, on which blackfaced sheep are kept. In the city and adjacent

byres some of the calves are fed off for the butcher with all despatch, and sold as veal; others, as already stated, are sold to the upland farmers, either to rear as dairy cattle or to fatten for the shambles.

Cattle Feeding.—The majority of lowland farmers graze only a few cattle in summer, but in winter feed many more. The Board of Trade returns afford no information as to numbers, as the bulk of the feeding cattle are purchased in during autumn, and sold off before the returns are collected in the following year. The beasts for fattening consist largely of strong shorthorn crosses from the southern counties of Scotland and the north of England, with here and there a sprinkling of Irish. These crosses are two to three years old when bought in, and are sold off as they become ready during the winter and spring months, the whole being cleared out by June. It is not uncommon for the in-buying price to be doubled, while there is generally a sufficient margin to fully remunerate the feeder. Sometimes good crosses are kept over-year and finished off by the following Christmas, when they make heavy weights. This system is, however, far from common. The food given to fattening animals is turnips, straw, cake, and corn, with or without a little hay. Roots are not given *ad libitum* as in some counties, only a sufficient quantity being allowed to keep the animal in a healthy, thriving condition. Crushed oats and rye are used in a few instances, so are refuse potatoes, when the crop is lifted by the owner. Mr Ford, Hardengreen, one of the best feeders in Mid-Lothian, uses hay, cake, and crushed grain. These substances he finds to answer well, and his cross-breeds thrive admirably upon such generous fare. He has tried the experiment of running a few crosses upon rough pastures in the winter, allowing nothing but what they gather for themselves, and yet they make fair progress. Of course, they require a little better diet at the finish, but it is well bestowed. Mr Dickson, Saughton Mains, is also a noted feeder. In addition to straw and turnips, his cattle are liberally supplied with extraneous food, and are consequently sent off ripe before they have been long in his hands. Mr George Davidson, Walton, is one of the most noted feeders in West Lothian. He purchases either the best Irish or Westmorland cattle in the fall of the year, when the turnip crop is ready for use. A sufficient quantity of roots is allowed, to prevent the animals from requiring water, with a daily allowance of 3 lbs. of linseed cake. In addition to this, they get a feed of the following mixture once or twice a day:—Crushed cotton cake, grains, light wheat, beans, oats, light barley, and cut straw—or hay, when cheap—damped a few hours before use. On this fare they make good headway, and are quite healthy. Those which are ripe go off to market by the end of the year, when the stalls they occupy are filled

by a few choice cattle drawn from the ordinary winter stock. The remnants are sold in spring and early summer, the whole being cleared out by June. The last consignments in the summer of 1876 realised L.35 each. Last year (1875), Mr Davidson tried an experiment with some pasture land purposely left rough in the autumn. He purchased a cheap lot of West Highland stirks at the Falkirk October Tryst for L.6, 5s. per head. They thrived amazingly, and with a little help in the spring, made considerably over L.20 each. The courts at Walton are all covered in, Mr Davidson having little faith in open sheds for feeding purposes. "Loss of heat is loss of meat," he rightly considers, to say nothing of the superior quality of the manure which is made under cover. Mr Davidson also grazes a few stirks upon the pastures, winters them, and feeds off in the following summer. Mr Peter Wilson, Broomieknowes, who has a mixed farm consisting of arable land and hill pasture, grazes cattle upon the hill in summer, and finishes them in the courts upon turnips, straw, and corn or cake in winter. So long as straw commands 4d. to 6d. per stone, Mr Wm. W. Anderson, Norton Mains, Mid-Lothian, thinks it profitable to sell it, and purchase an equivalent in town manure from Edinburgh or Glasgow. When the straw falls short of that price, he buys in cattle to consume it along with the turnips. Mr John Fortune, Inglishton feeds cattle in the open courts in summer with cut grass. This system makes good manure, and brings in a return of about L.10 per acre.

The dairymen in the district lying in and around Edinburgh change their cattle as a rule every year, sometimes oftener. The animals are purchased either on the eve of calving, or soon after the calves are dropped, and are hard fed and milked for eight or ten months, when, by a gradual change in the character of the food, the cows become dry, and are soon good beef. Thus they bring in sometimes as much, and occasionally more than first cost. In other cases they lose a little, and this is more common since the great advance in the price of newly-calved cattle, or those close on profit. In the more remote dairy localities, cattle are milked for one, two, or three seasons, so that there is not so much beef produced as where there is more pressure brought to bear upon the management. Milk being the primary object of the Edinburgh dairyman, he caters for it in every way, using substances in the forcing which would soon ruin the constitution of the cow. It is therefore to his interest to change his stock often, even if a little loss be experienced. We may here note that of late years large lots of foreign cows in calf are readily bought by city dairymen, at prices ranging from L.7 to L.15 each. These, as a rule, milk well, and are less risk to the owner, owing to their small cost; while, when fat, they frequently make L.3 to L.5

a-piece over inlaid price. We have said that Ayrshires and short-horns sometimes lose a little, so that the dairyman is now drifting into the stocking which requires less capital, and is more sure of maintaining or exceeding its original value. Some of the foreign stock make very nice beef, and are readily picked up by butchers if their age is not too great.

Dairying.—Of the 19,004 cattle returned by the farmers of Edinburgh, 9614 come under the head of cows and heifers in milk. Besides these, there are about 1800 to 2000 milch cattle in the town and suburbs of Edinburgh, making a total of between 11,000 and 12,000 coming under the dairy interest. In Linlithgow, 3541 of the 11,543 may be classed as dairy stock, making a total for the two counties of about 15,000 head. In Mid-Lothian dairying has increased much in recent years. In the city of Edinburgh it has fallen off slightly, but has been fully compensated for by the extra number of stock kept, specially in the country, to supply the requirements of the town. Previous to the rinderpest year, the number of dairy cattle in Edinburgh was stated at 2100 or 2200; but the grievous plague claimed many as its victims, and the original quantity was never again fully made up. The Cattle Sheds Act, too, reduced the numbers to some extent. This insured a regular inspection of the byres, and a report as to whether they were properly constructed, had good sanitary regulations, and were well kept in general. Many were condemned, and the country thus came in for a larger share of the town's business. Had the town's cattle increased with the requirements of the population in place of falling off, they would now have, doubtless, numbered close upon 4000. Most of the produce of these cattle is sold as sweet milk. There are also dairies in the suburbs constructed on much the same principle as those in the city. In summer the cows are fed upon grass obtained from the irrigation meadows, together with brewers' grains, bran, and meal; in winter, they have hay, cut turnips, grains, beanmeal, and straw. Both feeding and milking take place three times a-day, except when the cows are being put dry. Besides the foreign cattle already mentioned, the breed consists of Ayrshires and crosses. It is computed that about one-half of the milk required in Edinburgh is obtained from the city dairies; the remainder is driven from the country, or, in some instances, where far distant, sent by rail. Amongst those who keep shorthorn crosses for dairying purposes, may be mentioned Mr Stenhouse, South Gyle, Corstorphine, who has about 60 cows; Mr Thomas Mylne, Niddrie Mains, who has 50 cows; Mr James Hope, Duddingston, whose byres contain over 70 dairy cattle; and Mrs Mure, Mid-Kinleith, who has 40, more or less. The 50 cows at the large dairy of Morningside, Egypt, owned by Mr Begbie, also belong, with a few exceptions,

to the cross breeds. On many of the large dairy farms pure Ayrshires are kept. Mr James Fleming, Coates, Penicuik, has, off and on, 50 of this favourite breed; the Duke of Buccleuch has 20 at Dalkeith Park; Mr Ainslie, Hillend, has 40 to 50; Mr Walter Kidd, about 50 at Balleny; and Mr Robertson, Harlaw, Currie, has between 30 and 40 of his own rearing. Mr Meikle, Seafield, keeps pure Ayrshires, his herd, for dairy purposes, numbering about 40; Mr Mackay, West Craigs, has 20 of the same breed, and Mr M'Vicar, Woodend, 15 to 20. The three last named stocks being in Linlithgow, the owners do not send their milk into Edinburgh, but find an offgate in another way. Mr Meikle has sent his churned milk to Newcastle for seventeen or eighteen years. The Penicuik and Currie districts in Mid-Lothian are both well adapted for dairy stock; and when sweet milk began to be scarce in Edinburgh, during the time of rinderpest, several farmers commenced driving their milk to the town, and have done so ever since. The method of feeding varies much according to the kind of cows kept, the district to which the dairy belongs, and other circumstances. On a dairy-farm in the Penicuik district, the cows are kept upon the pastures in summer, and get a feed of draff twice a-day; in winter they have boiled turnips mixed with feeding meals and draff twice a-day, raw turnips twice, with hay and straw each once in the day. The cost of the food is calculated at 12s. per week. Upon another farm, the cattle get cut vetches and meal in summer, besides liberty upon a good pasture; and in winter have turnips three times a-day, and hay or straw twice. Cost of maintenance, exclusive of attendance, 12s. to 13s. in winter; in summer, 7s. to 7s. 6d. In the parish of Torphichen, Linlithgow, a farmer who drives milk, feeds on turnips, meal, draff, and hay in winter, at a cost of 10s. to 11s., and estimates the summer-keep at L.7 for twenty weeks. Another farmer in the parish of Linlithgow, who feeds in much the same way, calculates 11s. to 12s. as a fair average all the year round. His cows for this, return three to four gallons of milk daily throughout the season. On a farm in the Currie district, the cows are grazed in summer, and have a feed of cut grass at night; in the winter they get turnips, draff, meal, cake, and straw. Estimated cost, 14s. per week. The instances quoted scarcely give a fair criterion of the cost of keeping a cow, as the owners, having most of the food in their own hands, do not estimate everything at full price. The city dairies show a much larger expenditure. At Morningside the cows average about 18s. per head. Mr Honeyman, Dalry, gives 19s. to 21s. as the probable cost. Mr Mylne, Niddrie Mains, gives 17s. 6d., and some others estimate L.1. This may be a little over the mark, but where cows are kept in the stalls all the year, the expense is undoubtedly heavy.

We received various estimates as to the quantity of milk an average cow would produce. Some of the best, in the height of the season, give six gallons daily for a long time, while five is common. A good average for a dairy, throughout the season, is about four gallons; this is seldom exceeded, and not often reached; three and a-half gallons will be about the most correct figure to put down approximately. We have heard it stated at three gallons, but this, we are convinced, after making numerous inquiries, is too little. The selling price is 11d. per gallon, so that a cow which holds out at three and a-half gallons per day will bring in 24s. 1½d. per week. There are, however, many incidental expenses, not calculated in the returns, which bring up the cost of keep so near that of amount realised by produce, that there is a very small balance kept for profit. There is sometimes an offset in the difference between the buying-in and selling-out price of cattle, especially where the milk is much forced.

Shorthorns.—There is comparatively little fancy breeding carried on in either county. The shorthorn mania has probably not reached this district: if so, it has at least gained very little ground. Still there are two very nice herds of shorthorns, one at Dalkeith House, the property of the Duke of Buccleuch, and the other at Halkerston, the owner being Mr Currie. They are both well descended, and are carefully managed, fresh strains of blood being introduced from time to time from herds of repute. The commercial stocks of the counties, generally, may be classed under the head of Ayrshire and shorthorn crosses, with a fair proportion of Dutch in the city dairies.

Sheep Farming.

As a sheep-producing county, Mid-Lothian is the fourteenth in Scotland; while West Lothian stands very low, two counties only, namely, Clackmannan and Nairn, returning a smaller number. But as we remarked of cattle, so we may say of sheep, that if the returns were made earlier in the season, the present figures would be much exceeded. Many of the turnip sheep upon the lowlands have been disposed of, and the new stocks are not laid in when the returns are made. The majority of the sheep accredited to the counties are therefore breeding flocks. On account of the rise in the price of meat during recent years and the stagnation in the grain trade, more attention has been paid to sheep-breeding, rearing and feeding. The number of sheep was in—

Year.	Edinburgh.	Linlithgow.	Year	Edinburgh.	Linlithgow.
1866,	113,479	23,070	1871,	153,387	16,848
1867,	153,704	28,729	1872,	162,492	19,534
1868,	157,330	23,056	1873,	170,901	22,081
1869,	157,164	16,882	1874,	171,608	22,692
1870,	156,282	15,661	1875,	172,982	20,561

The numbers have increased very much in Mid-Lothian in ten years, 59,503 more being returned in 1875 than in 1866. West Lothian has receded in ten years, but has gained ground since 1870, when only 15,664 were returned. The greatest increase in Edinburgh was in the year 1867, but the figures have since been steadily becoming larger. The formation of the Lothian Ram Society, a few years ago, gave an impetus to breeding, which has had a salutary effect, not only in the numbers reared, but in the quality of the stock as well. Several breeds are to be found in the counties. Of course the blackfaces chiefly occupy the hills; there are likewise large flocks of Cheviots; while half and three-parts bred sheep occupy the low grounds. In Mid-Lothian a few Cotswolds and Shropshires are reared, as well as several notable flocks of Border Leicesters. Foremost among the owners of blackfaced in this county are Mr Archibald, Overshiels; Mr Aitken, Listonshiels; Mr Murray, Eastside; Mr Melrose, Westloch, and Mr Gray, Harper-rigg. The Cheviot breeders are Mrs Moffat, Kinleith; Mr Stevenson, Mount-Lothian; Mr Penman, Bonally, and Mr Plenderleith, Moorfoot. The Border Leicester breeders are the Duke of Buccleuch; Earl of Morton; Mr Melvin, Bonnington; Mr Ford, Hardengreen; and Mr Ainslie, Hillend.

Blackfaces.—Although the Cheviot breed is preferred in some parts, there is still a lingering attachment to the old blackfaced type in others. This hardy breed has for ages occupied the hills of Scotland, and great improvement in its appearance has in late years been effected. The race is extremely hardy, and consequently of great value upon exposed hills and mountain sheep walks. With slight variations, the lambing season occurs from the middle of April to the 20th of May. Twin lambs are exceptional, and as the ewes are excellent milkers, the progeny soon become strong and vigorous. A certain proportion of the gimmers fill up the place of the ewes which are drafted off at five or six years old and sold to English farmers, who take a crop of half-bred lambs from them, and then sell off fat. The wether lambs are mainly sold in the Lanark and Sanquhar markets, at prices ranging all the way from 12s. to 24s. per head, to non-breeders, who keep them till three years of age, and then dispose of them to the southern markets to fatten on turnips. Mr Archibald has one of the finest flocks of blackfaces to be seen in the country. The lambs are dropped on the hill farms of Overshiels and Midcrosswood, where they are weaned early in August. The tups are then put upon a good pasture until the autumn, when they are fed on turnips and hay until March. Those intended for sale are forced forward with cake and beans until the time for disposal. The ewes and gimmers are fed on grass and turnips. Clipping takes place about the

10th of July, and regular dipping constitutes a part of the successful management. The cast ewes are sold into England at six years of age. Tups from this flock realise as far as L.55; generally making as far as L.13 to L.15 per head on the average when disposed of at the Lothian Ram Sales. Mr Aitken, Listonshiels, has had a fine flock of blackfaces for over twenty years. The sheep are summered on the high parts of the farm and wintered on the lower pastures. No food is given except a little hay in case of a snowstorm occurring. Last year (1875) 40 rams from the flock averaged L.9, 6s. 4½d., the highest price being L.36. Mr Gray, Harper-rigg has had blackfaced sheep over twenty years. No hand-feeding is practised. The flock numbers 500, the ewes being kept until five crops of lambs are taken, and are then replaced by gimmers. Mr Currie has established a nice flock of blackfaced sheep at Yorkston, in the Gorebridge district. Hay is the only extra food given, and that only in a snowstorm. Mr Archibald McVicar, Woodend, Linlithgow, keeps 500 to 600 blackfaced ewes, and breeds cross lambs chiefly by Leicester tups. In most respects the management is similar to that of many of the Mid-Lothian breeders. Of West Lothian, generally, we may say, that few blackfaced flocks are kept from which rams are bred for the Lothian Ram Sales; indeed, a great many farmers breed crosses only for feeding purposes, except perhaps a few pure-breds to fill the places of the draft ewes.

Cheviots.—In many parts of Scotland the Cheviot race has supplanted the blackfaces. This type occupies in part the highland and in part the lowland country; Cheviots may, therefore be described as an intermediate race between the small, fell, or hill descriptions and the larger animals of the plains. They pasture on the hill in summer, and are brought down into the fields in winter and kept on foggage or old pasture. This breed is the most hardy of all the whitefaced varieties. The original race, which cropped the herbage of the Cheviot Hills (whence they derive their name), are described as having been small in size, light in bone, and poor in wool, but having a hardy constitution. Their heads and legs exhibited, for the most part, a slight tinge of brown. Altogether, the breed bore little resemblance to the finely proportioned animals which represent the type of the present day. About 100 years ago the race of improvement began, and for at least three-quarters of a century the Cheviot has been gradually encroaching on the domain of the blackface, from its original home on the Cheviot Hills as far north as John o'Groats, within a stone's cast of which we have seen a splendid flock of this type feeding. In the counties under notice this has also been going on to a certain extent; what the proportions of each breed now are is a question difficult to answer. The man-

agement of Cheviots, with trifling exceptions, is everywhere much the same. In some cases the hoggets are never weaned; in others, they are separated from their mothers for a few days only, and then put back to them. Ewes seldom have lambs until they are two years old, and are sold off, as in the case of blackfaces, at five or six to bear a crop of half-breds in England. Shearing of the Cheviot flocks takes place in July, the weight and quality of the fleece depending much upon the pasture, thus verifying the old adage which states that "the wool goes in at the mouth." Mr Stevenson, Mount Lothian, has a flock of 400 Cheviot ewes. In the summer they feed upon the hill pastures, and in winter have a few turnips. Several rams are annually bred and disposed of at the Lothian Ram Sales, where they always realise good prices. Mr Penman, Bonally, owns a very old established flock of Cheviots, dating back upwards of forty years. On the 1st of April the lambing gimmers are taken from the hill to the grass parks. After lambing the ewes and their progeny are sent back to the hills for the summer. Clipping takes place early in July, and dipping in September and again in January. Ritchie's dip is now generally preferred. Rams are sold at the annual sales and bring good prices. Mr Plenderleith has bred Cheviots at Moorfoot for a quarter of a century. The stock is mostly kept to the hill pastures, a little hay being given when required. Rams from this fold bring as far as L.20 at their early sales. Perhaps the best and largest flock of Cheviots in Mid-Lothian belongs to Mrs Moffat, Easter Kinleith, Currie. About the 1st of March the gimmers in lamb and the weaker end of the ewes are put on hay and turnips until the lambing season. This gives them strength, and the dams have a good supply of milk, while the lambs are healthy and sprightly. Weaning takes place in July, about 40 or 50 of the best male lambs being kept for rams. The highest price ever reached was L.78, but L.30, L.40, and L.50 are common figures.

Border Leicesters.—This celebrated breed of sheep, which is said to have been introduced into the Border counties by Messrs Cully upwards of a century ago, has several admirers in the Lothians. Much discussion—and even dissension—has been provoked of late anent the qualities of the Border Leicester, but it is not within the pale of this report to enter into the merits and demerits of the breed; we therefore pass these points over with the remark, that whatever faults may be adduced, some of the flocks we have seen not only seem to thrive and do well, but also leave a handsome profit in the hands of the breeder and rearer. The Border Leicester has the reputation of producing a larger quantity of mutton and wool than almost any other breed. The flesh they produce is, however, somewhat coarse in grain and tallowy in the fat. In the most noted flocks the male

lambs are kept for tups, and disposed of at the annual sales at Edinburgh. Some of the rams thus dispersed go to improve existing flocks of the same breed in various parts of the country, while others are used for crossing Cheviots or blackfaced ewes. The crosses from blackfaces attain a considerable size by the time they are two years old, and are much esteemed for their fine quality of flesh. The Cheviot crosses, too, although a little slower, have fine quality, and arrive at a large size with longer keep. Where half-bred ewes are kept and crossed with pure-bred tups, the progeny arrive rapidly at maturity, and produce a large amount of wool and meat. By way of illustrating the management of the Border Leicester breed, we may briefly notice the system adopted by the Duke of Buccleuch at Dalkeith Park. The flock of breeding numbers 140 to 150, and has been in existence twenty years. The ewes occupy the lighter land in summer and in winter have a few turnips. The lambing time begins in March. In winter the ram lambs get a little cake and hay, while the ewe hoggs get the best of the parks. The flock has achieved many honours in show-yards, and is held in great repute. Mr Ainslie, Hillend, has a nice fold of Border Leicesters, and one of half-breds as well. The former numbers about 120. The diet is moderate, as the ewes get too fat when it is liberal. Mr Ford, Hardengreen, has a standing flock of from five to eight score. Nothing but grass is given to the ewes in summer, but after the new year they get a few turnips. The tups get cake and corn, those intended for sale or the show-yard receiving a more liberal allowance. The rams realise high prices at the Edinburgh sales; last year (1875), the average for 45 was over L.9. There are several other folds of note in the district, the management of which we have not space to detail.

Cross Breeds.—As already stated, crosses are numerous. By these the bulk of the turnip crop not required for cattle is consumed. The practice is to draw every four alternate stiches, leaving the other four to be eaten off by sheep. In this way the soil is enriched for the succeeding white crop, a greater breadth of land getting the benefit of the sheeps' droppings. Many farmers cart the turnips to a lea field, and there cut them for the sheep, but a large breadth is still, however, consumed where they grow. A great many sheep are in this way annually fed off, being purchased in during the autumn sales and going off as they are ready for the market. Some of the lots leave as much as 1s. per week for their keep, but when 7d. to 8d. per week is reached the grower is commonly satisfied. Many farmers now allow a little cake or corn along with the roots, which forces the sheep forward, and more money is commanded in the market. Others feed on turnips, *par et simple*, with perhaps a little hay or straw in case of a hard frost. The numbers of sheep in both

counties will be swelled out in the winter season at least 40 to 50 per cent. by these commercial or flying stocks; in spring they again sink to their ordinary level.

Horses.

The number of agricultural horses in Mid-Lothian is small compared with the aggregate in some counties of similar size. Linlithgow has about one-half the number. The large county of Aberdeen contains six times as many as the former; twelve times as many as the latter. The numbers were in—

Year.	Edinburgh.	Linlithgow.	Year.	Edinburgh.	Linlithgow.
1869,	4679	2174	1872,	4433	1984
1870,	3989	1961	1874,	4000	2039
1871,	4126	1977	1875,	4079	2077

There has been a decrease in both counties within the past seven years, but not to any large extent. A few farmers, we have already noticed, are introducing two years' grass in place of one; this makes some difference in the number required, and others are going into steam cultivation, which also to some extent tends to decrease the quantity required. Of the 4079 returned in Edinburgh, only 705 are unbroken, so that very few are reared in the county. Linlithgow, with a total of 2077, contains 559 unbroken animals, as breeding is carried on a little more extensively. The work horses as a rule are of a good stamp. Most of them are either pure Clydesdales, or have been largely mixed with Clydesdale blood. A few farmers in the west of Linlithgow breed excellent types, the best of the produce bringing as far as L.80 to L.90, and now and then one over L.100. We may here mention the name of Mr James Mackay, who is well known in local show-yards as being a successful prize-taker. The horses he rears always bring high prices. Mr Orr, The Hill, also breeds some splendid Clydesdales, for which he has taken honours in Linlithgow and Bathgate. Great care is bestowed in both feeding and grooming, the diet varying at different periods of the year, according to the work they have to do. When the spring pressure is on, the farm horses are fed upon hay, oats, and beans, with now and then a warm mash. Occasionally, a few potatoes are given, as well as carrots or swedes. The horsemen, in general, seem to take great pleasure in having the animals under their care in good condition, while the harness is clean and well kept. In the towns, particularly in Edinburgh, there are many horses in addition to those accounted for in the Board of Trade Returns. These consist of various breeds for drawing drays, cabs, 'buses, and tram-cars, with a few used for riding and driving by business men and private families. The number of horses required by the Edinburgh Street Tramway's Company varies from 470

to 490, according to the traffic. The present rate of feeding which keeps them in capital condition, is on an average per diem—

Cut hay,	10 lbs.
Bruised oats,	3 lbs.
„ beans,	2 lbs.
„ maize,	12 lbs.

Pigs.

In neither county is pig-breeding or pig-feeding carried on to any considerable extent. In Edinburgh the number in 1866 was 9699; in 1875, it was 5191, thus showing a decrease of 4418 in nine years. In 1866, Linlithgow contained 3166; in 1875, the number had fallen to 1978, being a decrease of 1188 in nine years. While the porcine tribe have gone back much of late in point of numbers, great improvement is noticeable in the quality. This has been effected by the introduction of boars from other parts, and by the superior attention paid to the housing and general management. A few pigs are commonly kept upon every farm to consume the offal from the kitchen and the wash from the dairy. A little meal is given to finish them, but they are at other times kept at very little expense. Many cottagers still have the privilege of keeping a pig, and when once fattened, forms no inconsiderable item in the year's stock of provisions.

Dogs and Poultry.

Where sheep exist in large numbers, especially upon the hills, a well-trained dog is invaluable, so that in the south and south-west parts of the counties several well-bred collies are kept. The instinct and sagacity of the shepherd's dog have often been commented on. The old habit of calling the dogs after the name of a river is still in full force, but whether the shepherds yet believe that this will prevent the animals from going mad, we cannot say. However, "Tweed," "Yarrow," and other kindred names seem to be as common as they were before the whistle of the locomotive was heard in the Scottish valleys.

Poultry are kept on almost every farm to peck up the "odds and ends." Close to Edinburgh, they are on some farms kept on a large scale, as there is always good demand for the eggs. Some of the housewives are therefore able to show a favourable balance sheet, but the poultry undoubtedly consume much food which never finds its way to the expenditure side of the cash-book. The varieties are numerous, including Dorkings, Brahmas and the old-fashioned game breed. Crosses between the two former are reckoned the best table birds. A few geese and ducks are also reared, and here and there fancy birds, as peacocks and guinea fowls, are to be seen.

Improvement in Twenty-five Years.

Although for more than half a century the farming practised in the Lothians has been of a superior kind, it must not be inferred that no improvements have recently been made. The area of land reclaimed within the past twenty-five years has not, as already stated, been so large as in some counties, simply because there was less for the proprietor or the farmer to accomplish. Still, in the hill districts, whole tracts have been brought under the plough and made to yield abundantly, which previously produced only a scanty subsistence for sheep. In the Gala Water district, in Mid-Lothian, almost the whole face of the country has been changed within the limit of this Report—since the railway passed through the locality. Half and three-parts bred sheep have superseded the native breeds in a great measure, and are thus adding much to the wealth of this part of the country. A large breadth of land in and around the parish of Currie, has also been improved, particularly the sheep pastures which have been drained and top-dressed. The plough has likewise been encroaching on the mountain heath. By draining, liming, and breaking up, Mr Walter Kidd has recently raised the farm of Balleny to a high state of productiveness, a report of which has already appeared in the Society's Transactions. Mr Robertson, Harlaw, has drained and limed a vast extent, the latter costing as much in some cases as L.6 per acre. Mr Gray, Harper-rigg, has limed a large area of sheep pasture, and also drained where required. In the Penicuik locality much land now under cropping was waste fifty years ago, a considerable breadth having been gone over within twenty-five years. For the most part, the owners provided the outlay-capital; the tenants performing, and paying interest for money invested. Mr Fleming, Coates, has brought 150 acres of bog into good arable land within twenty years. On many farms the area of ploughing land has been increased: on some extensively, as Coates, Mount Lothian, Walston, and Mirefield, with several others. A few miles south of Edinburgh, a large proportion of the soil was in its natural and barren state less than thirty years ago, and was almost wholly depastured by blackfaced sheep. It has since been improved by draining, fencing, liming, and breaking up. A superior class of stocking is kept, the land producing oats, turnips, and grass abundantly. Lime is plentiful and is liberally applied. In West Lothian, too, the race of improvement has for some time been going on, especially in the hill districts. In the parish of Linlithgow, Mr Wilson has added to his extent of cropping at Lochend by taking out rough fences and reclaiming waste patches, while the land has been drained and otherwise improved. Mr George Davidson, Walton, has drained much,

and enriched all his soil by the consumption of cake and the liberal use of manures. Mr Wilson has effected great improvement at Riccarton, by draining and top-dressing; and a similar statement may be made anent the farms of West Craigs, Woodend, and Hilderstone in the south-west of the county. Mr Meikle, Seafield, has drained almost all his farm within the currency of the present lease, the landlord finding the tiles and the tenant paying for the cutting. In short, on nearly every farm in both counties, improvements, more or less, have been effected within the past quarter of a century. The reclamation of land has necessarily been attended with great expense in fencing. In some instances, dry stone walls have been built; in others, wire fencing has been substituted. Clumps of trees have also been planted with good effect, thus affording shelter for stock and enhancing the beauty of the out-stretching landscape.

Another noticeable improvement is in the deeper cultivation of the land already under the plough. The farmers, as a rule, manure with no sparing hand, and of late years, in addition to the large amount of artificial manures used, an enormous quantity of extraneous food for stock has also been purchased. The consumption of feeding cakes and other substances upon pasture is one of the best methods of enriching the soil, especially cotton cake, which has a higher manurial value than any other commodity in the market.

The Highland Society, with many Local Agricultural Societies, have been of great usefulness in the advancement of agriculture. The annual shows connected with these serve as a healthy impetus to farmers in the improvement of their stock, and perhaps in no other branch of husbandry has so much progress been made as in the breeding and quality of sheep. Much credit is due to the promoters of the Lothian Ram Sales in this matter, as the annual dispersion of so large a quantity of well-bred rams must have a wholesome influence upon the breed in the districts where their several lots are cast. Farmers' Clubs have also done some service, inasmuch as members are enabled to discuss questions and interchange ideas, by which the intelligent mind will rarely fail to profit in some degree.

In both counties, the farm implements in use are of the first order. Nearly the whole of the grain is threshed out by steam machines, the chimney-stalk forming a conspicuous landmark on almost every large holding. There are still on the smaller farms a few machines driven by horses or water-power, and occasionally the monotonous tap-tap of the barnman's flail may yet be heard. Mowers, reapers, tedders, hay-rakes, in fact, all kinds of labour-saving machines, are now in almost every farmer's possession; while single and drill-ploughs, iron harrows, seed-drills, and various other improved implements, render the working of

the soil comparatively easy to what it was twenty-five years ago. Even the hay and manure forks are better constructed and lighter than those formerly used, and the old ones have been laid aside with the scythe and sickle of bygone days.

The Farm Labourer.

The position of the farm labourer will bear favourable comparison with most other parts. On the principal farms there is a sufficiency of cottage accommodation, which has a beneficial influence on the character of the labourer both in a social and moral aspect. Wages generally are high, having advanced very much in twenty-five, and even in ten years. Notwithstanding these advantages, there has of late been a growing scarcity of labourers, as inducements to go to other sorts of work have been strong in this part of the country. When the rate of wages at the collieries rose so rapidly two or three years ago, many of the most able hands bade farewell to the plough and shouldered the pick. Good pay and short hours—the thought of having more time to themselves—proved to be irresistible temptations, and they succeeded in attracting the best men from the farms to the great centres of other local industries. We often heard, when paying the farmers a visit, the complaint that “good men are now exceedingly scarce.” Wages have gone up fully 50 per cent. in twenty-five years: 40 per cent. in ten years, and L.10 per annum in five years.

In the neighbourhood of Edinburgh, regular farm-servants get L.35 or L.36 in money, $6\frac{1}{2}$ bolls of oatmeal, 4 bolls of potatoes, coals driven, one month's meat in harvest, and a cottage and garden. Total, about L.52 or L.1 per week. Ordinary labourers receive 16s. to 20s. per week; women workers 9s., and harvest hands are regulated by the law of supply and demand.

In the district of Gala Water ploughmen obtain L.20 in money; $6\frac{1}{2}$ bolls of oatmeal; 1200 yards of potato ground; dwelling-house; month's meat in harvest, or L.1, 5s. as equivalent; fuel at pit price; 24 qrs. barley; cow kept, and sometimes purchased; and litter for a pig. Estimate in money, L.52, or just about the same as near Edinburgh, only more is paid in kind. Ordinary labourers are often scarce, even at 4s. per day.

A few miles to the west of Edinburgh, ploughmen have L.37 in money; free house and garden; 4 bolls of potatoes; $6\frac{1}{2}$ bolls of oatmeal; coals led; equal in all to L.1 per week. In fact, wages throughout Mid-Lothian for ploughmen range from L.51 to L.53 per annum, the rate differing little between the low country and the hill districts.

In West Lothian payments are much the same. For example, Mr John Wilson, Riccarton, gives his ploughmen L.36 to L.38; $6\frac{1}{2}$ bolls meal; 4 bolls potatoes; house and garden, rent free;

coals driven, or at pit price; and a month's meat in harvest. Total, L.52 to L.54. Servant women have L.7 to L.9 per half year with food. Happily, there is no bothy system, the young men being hired by the half year, and boarded in the farm house.

In the Carriden district, ploughmen get L.35 to L.36 in cash; 6½ bolls oatmeal, worth say L.7, 10s.; 1000 yards of potatoes in the drill, value, L.4; free house and garden, L.4; coals driven, L.1; and a month's meat in harvest, L.1. Total, L.52 to L.53. In many cases, a pig is kept in addition to the above perquisites, and milk allowed at a low rate.

With the exception of a little uneasiness now and then, caused by a desire to leave farm work and obtain employment in other spheres of industry, the labourers of this district are a contented and happy race of people. With most of the necessaries of life already provided for them, they have comparatively little care and anxiety, and not a few families lay by part of their earnings for the proverbial "rainy day." The majority take great delight in their homes. The little patch of garden affords them occupation for their leisure moments, and here and there are beds of flowers neatly and tastefully arranged. Literature seems to be in the ascendant, for almost every family has its weekly newspaper. The children are fairly—some of them well—educated, and many, in riper years, do good service in the commercial walks of life. Often the labourer stays upon one farm during the whole of his days, becoming as it were rooted to the soil, and when old age and infirmity creep on, has the satisfaction of seeing his place filled by one of his offspring. All in all, we rarely, if ever, saw a more thriving or contented race of peasantry, and this causes us to regret that year by year the ranks of the labouring classes are becoming thinner.

Before leaving this subject, we believe it will be interesting to state the amount of remuneration given three-quarters of a century ago. In Cranston, the wages of a ploughman were L.2, 15s. to L.3, 6s. for the half-year; for a hind, L.5 to L.5, 10s. for the year, with grass for a cow, and two pecks of meal per week. Extra labourers (men) received 10d. to 1s. per day in winter, and 1s. 2d. in summer. In Kirknewton, labouring men got 1s. to 1s. 2d. per day in summer, and 10d. in winter, and females 6d.: wages of maid servants, L.3 per year. In the parish of Stow, in 1759, hired men received L.3, 4s. per annum; women, L.2; and extra labourers, 4d. per day, with food, in winter, and 6d. in summer. In 1795, wages for hired men had risen to L.6, 10s. for the year, and women L.3, 10s.; day labourers receiving 6d. in winter and 8d. in summer, with victuals, and higher rates in harvest, but even then 1s. to 1s. 3d. was seldom exceeded.

The wages of the present day present a wonderful contrast to

those of the times alluded to; the total cost of manual labour upon an arable farm, especially where many potatoes are grown, being high. On large farms close to Edinburgh, having only one year's grass in the rotation, the amount per acre is estimated at 38s. to 45s., in some cases as far as 48s. Twenty-five years ago the outlay in the same localities ranged from 24s. to 28s., or 30s. at most. Thus it will be seen that working expenses have gone up at least 50 per cent. on regular crop farms, while in the more remote districts the uprise may be put down at 25 to 30 per cent.

Miscellaneous Observations.

Size of Farms.—The subjoined table shows the number of holdings of various sizes in Mid-Lothian:—

50 acres and under.	50 to 100 acres.	100 to 300 acres.	300 to 500 acres.	Over 500 acres.	Total number.
477	116	294	75	50	1012

The number of holdings in West Lothian is—

50 acres and under.	50 to 100 acres.	100 to 300 acres.	300 to 500 acres.	Over 500 acres.	Total number.
212	105	190	28	7	542

The average extent of farms in Edinburgh is 131 acres; that in Linlithgow, 108 acres. In the former, the number of occupiers having less than 20 acres is 357; in the latter, 145. Ordinary farms in Mid-Lothian range from 100 to 400 acres, some occupations in the hill districts being still larger. Six separate holdings range over 1000 acres each, and it is not at all unusual for one farmer to hold several occupancies. In West Lothian the ordinary size of farms is 80 to 200 acres; a few farmers, however, rent 300 to 500, or even 600 acres where more than one farm is held. There are only seven farms with an extent exceeding 500 acres, one of which contains over 1000 acres. For the sake of comparison, we may state that East Lothian has 200 acres to each occupier; Berwick, 197; Roxburgh, 146; and Wigtown stands in a similar position to Linlithgow, having 110 acres. On the whole, the landed property is well divided, suiting the advanced state of husbandry practised in the district, but we heard a few complaints of farmers having an excess in hand. Much might be said upon the subject of large *versus* small farms, there being arguments in favour of both sides, but it is not within the province of this paper to attempt to discuss the question. Within twenty-five years there has been little change in the extent of the occupations, nor indeed in the names of the occupiers, for farms not unfrequently go from father to son for several generations. Many whom we visited were in their second or even third nineteen years' lease, and this speaks

volumes for the good understanding which generally exists between landlord and tenant. A glance at the picturesque landscape from some point of vantage ground may suggest the idea that there are too many hedges, but this idea is dispelled upon closer examination. Not that there are no irregular fences and small fields, where in bygone times zealous farmers had enclosed the most fertile patches without any further aim; but, as a rule, the fields are large and well laid off. The size varies from 10 to 20 acres, while parks of 30 or 40 acres are by no means uncommon.

Rent of Land.—The valued rent of Mid-Lothian in 1674 was L.191,055 Scots, or L.15,921 sterling; the new valuation for 1876-77 is L.558,194 (exclusive of railways); valuation of railways (less the portion situated within burghs) L.112,694. The valued rent of West Lothian in 1674 was L.60,880 Scots, or L.5073 sterling; the new valuation for 1876-77 (exclusive of railways and canals) is L.189,198; of railways and canals, L.47,039. Rents of farms vary much according to quality and capabilities of the land, and its proximity or otherwise to the city of Edinburgh. Fields of pasture, let solely as accommodation land, realise as much as L.6 to L.10 per acre; soil suitable for gardens, L.8 to L.12; while for ordinary farming purposes in some localities it reaches L.4 or L.5. These high-rented tracts are, however, not only of first quality, and so situated that the produce is sold at the highest cost, but they are also within easy reach of manure. Approximately, the whole of the arable land in Mid-Lothian may be calculated at 40s. to 55s. per acre, while the hill pastures may average 10s. to 15s. throughout. The rent of the parish of Newton may be put down at L.3 to L.5, and of the parish of Gogar at L.2 to L.3 per imperial acre. Three-fourths of a century ago, good pasture or meadow land in the parish of Dalkeith let at L.3 to L.5; whole farms at L.1 to L.1, 15s. and L.2; and gardens at L.3 to L.5, 10s. The rents in the parish of Cranston at the same period ranged from 5s. to 30s. per acre, and some as far as L.2. Since then, the figures have been quite doubled. Taking the whole range of enclosed land seventy-five years back, it will be quite safe to say that the rents have advanced cent. per cent.—60 per cent. in fifty years, and 25 to 30 per cent. in the past twenty-five years. After the Crimean War, rents rose rapidly, but the change since then has not been so marked, although there has still been an upward tendency. In recent years, the most advance has been in the hill districts, where improvements in draining, liming, manuring, and other descriptions of land reclamation have been zealously prosecuted. In Linlithgow the farms are not rented so heavily as in Edinburgh. To begin with, the soil is not naturally so fruitful, the district is further from a good market, and the land has not been so highly farmed and so liberally manured in previous years. It is an old

and a true proverb, that "land never forgets having been thoroughly managed." No fancy or accommodation prices are given, so that the rents paid may be taken as a commercial basis of what the land is really worth. Very little over-reaches L.3, per acre, and an average of L.2 to L.2, 10s. for the best districts, 30s. to 35s. for medium soils, and L.1 to 25s. for the worst land, will not be wide of the mark. Some hill pastures, considered separately, are even far below the figures quoted, only being valued at a few shillings per acre. The rent of the parish of Uphall is quite L.2, if not L.2, 2s., throughout; in Carriden, rents are 30s. to 40s., and, in extreme cases, 50s., but none above; in the parish of Linlithgow, 32s. for the worst, to 42s. or perhaps 45s. for the best, and in the high-lying parts not more than 25s. to 35s. The increase in the past twenty-five years may be calculated at little less than 10s. per acre, being in some cases as low as 10 per cent. uprise, in others as high as 30. An average of this may be stated at 20 per cent. With fairly prosperous years, we do not hear that farmers are overburdened with the price they pay for their land, but a failure in the turnip crop, disease in potatoes, or a disastrous corn harvest, like that experienced in 1872, sometimes gives them enough to do to make ends meet, without any offset as profit.

Fences.—On the high-lying farms stone walls prevail to a certain extent. These are generally 4 or 5 feet high, being furnished at the top with a coping. Where blackfaced sheep are kept, high walls are indispensable, as the woolly mountaineer is gifted with leaping powers of no common order. The boundary fences adjoining the main roads are often built with stone and mortar, and, though expensive at the outset, are efficient and lasting. Upon the hills, of late years, many sheep fences have been constructed of wire, and answer very well. Where these are varnished or painted every two or three years they last a long time. They are especially convenient on upland pasture, where the erection of stone walls is attended with much expense and difficulty. Quickset fences, or hedges composed of hawthorn, however, mostly prevail, and when neatly trimmed lend a charm to the rural prospect. In grazing fields, if allowed to grow high, they are valuable for shelter, but are detrimental to crops unless kept within proper bounds. Here and there, we imagine, there is too much hedgerow timber, for however much these isolated trees serve to enhance the beauty of the landscape in an artistic point of view, it cannot be denied that they impoverish the soil for a considerable distance by their roots drawing the nourishment from it, shade the crops from sun and air, destroy to a certain extent field ventilation, and harbour wood-pigeons, rooks, and other winged pests. Gates are well made, neatly hung, and on many estates carefully painted year by year.

In a word, there is little to be found fault with in the character of the fences; generally they are in keeping with the well-farmed fields they enclose.

Drainage.—At a very early period in the history of agriculture drainage was in part attended to. Not that it was attempted upon any large scale, but the wet portions of the arable land had a few cuts made in them to take off the water. These were filled with stones, and did a certain amount of good in clearing off the surface water. Later, wet fields were entirely stone-drained, but the cuts were not deep enough to be effective. In the majority of cases, the covers were barely out of the reach of the plough, while the best of the drains were only 2 to 2½ feet in depth. Their outlet was into a ditch or open course, which, if not regularly scoured, had an injurious effect in preventing the water from getting away. By the middle of the present century, quite three-fourths of the land requiring draining had been gone over in this way. Even earlier than this, many farms had been efficiently drained with tiles, but it is mainly within the range of the past twenty or twenty-five years that thorough drainage has been carried out. In stiff, retentive clay soils drains had to be laid down pretty closely, and the expense was something considerable. The cost of cutting alone was from 1s. to 1s. 3d. or 1s. 6d. per rood of 7 yards. Government money was taken in some cases, in others the tenants did the cutting and the landlord found the tiles, while occasionally the work was exclusively performed by the landlord or tenant alone. During recent years, the drains have been cut to a depth of 3 or 4 feet, and the water run off into a main drain provided with tiles of larger dimensions. A part of the cutting was done by means of a drain plough drawn by horses, but by far the greater portion was executed by extra labourers, engaged at so much per rood. In one way or another the whole of the two counties has been drained, and a large breadth of land twice over. Gravelly or sandy subsoils rarely required any expenditure in this way, but improvement in the soils overlying clay could only result after perfect drainage, which is rightly considered as the foundation of successful farming. Since the land has been thoroughly dried, there is a marked amelioration in the climate, which is now far more healthy and bracing.

Roads.—An elaborate road system renders access to every part of the counties comparatively easy. From the city of Edinburgh nine excellent roads radiate, leading to different towns in the adjoining counties. In Linlithgow are three principal roads extending throughout the whole length of the county. All the roads are kept in creditable repair. Broken whinstone is used for covering, and is found, from its hard nature, to be very durable. About 2s. 6d. per yard is paid for breakage, and it requires an

expert hand to break $1\frac{1}{2}$ yard per day. Cross roads are also numerous and well kept. Tolls still exist in this part of the country, and notwithstanding the extensive railway system and the various canals, which, combined, take most of the heavy traffic, a large yearly revenue is collected by the gate-keepers.

Buildings.—Within the past forty years, and especially in the last twenty-five years, the position of the Lothian farmer has been considerably elevated in the social scale. Old-fashioned farm-houses have, in consequence, given way to neat modern dwellings, combining convenience and comfort with architectural beauty of design. As regards the old farm-steadings, we may remark that they are not quite so central as could be desired, but this mainly arises from land having been added after the building site had been fixed. Modern farm-steads are better situated, and contain, for the most part, a commodious barn, with steam power thrashing machine and grinding mill, a good granary, well ventilated and roomy stables, and convenient byres, loose-boxes, and piggeries. These often enclose a square, in the centre of which is a good paved yard. Uncovered courts for cattle are still common. On almost every farm comfortable cottages have been erected for the labourers, so that they are conveniently near their work, and are within easy reach whenever their services are required. The cottage is invariably furnished with a good living room, a place to cook, wash, and bake in, with two at least, and often three, bedrooms. A plot of garden ground is also attached, and the thrift of the cottager is seen in the fine crops of vegetables which adorn his kitchen allotment. In fact, an air of quiet comfort everywhere seems to pervade the working classes, and in no section of Lothian agriculture has there been more melioration during the past quarter of a century than in the condition of these honest tillers of the soil. When leaving the subject of buildings, we may notice one point which rises up in our memory. There are few, if any, covered pastures. The importance of having the manure heap protected from the scorching rays of the sun as from the drenching rains, must be our excuse for noticing this great omission. As our experiments have been conducted from time to time, which pretty conclusively the superiority of dung made or kept under cover over that which is allowed to bleach in the sun or be washed by frequent rains, and this should be sufficient to set the agricultural mind a-thinking. Every large home-stead ought, in our opinion, to be furnished with a covered shed for manure—an important but not a very costly requisite!

Cultivation by Steam.

Steam cultivation is not nearly so much practised as might naturally be expected where agriculture is so well understood as

it is in Mid and West Lothian. The soil of most of the level tracts not only admits of, but requires deep cultivation, and the working of it is a serious strain upon the horses. Indeed, for many of the stiff soils, light horses are of little use for ploughing; this is doubtless one reason that the class of animals found on most farms is heavy, and altogether of a superior order. The fields in general are not badly laid off for cultivation by steam power, and little impediment is found in the way of boulders, rock, &c. One great drawback to the general usefulness of steam tackle is the large amount of capital required, as few farmers, after the necessary amount has been expended in stocking, have anything to spare to invest in steam appliances. Costly, and to a certain extent cumbersome, cultivation by steam appeals to men with large hearts and well-filled purses, and not to those who have already enough to do. Companies are, however, doing what individuals cannot accomplish, but, as we have already stated, farmers are a little slow in taking the important matter up. Still, we met with several who have employed the tackle furnished by enterprising companies, and they all speak highly of the efficiency of the work done by steam power. Mr Watson, Norton Mains, has often had his land cultivated by this agency. He finds the greatest benefit from deeply cultivating moderately light soils having a stiff clay subsoil. After steam culture has once been adopted, the land is much more easily wrought for many years. Mr John Wilson, Riccarton, also engages a Steam Company's tackle both in winter and spring, and grows splendid turnips after it. The benefit to the succeeding wheat crop is marvellous. This is to be accounted for by the loosening of the soil to a great depth, for the roots of wheat, taking a vertical direction, have more room for their healthy development. Several others employ steam at certain seasons, and we did not hear of one that does not acknowledge its superiority to horse power. By its aid the hardened "pan" is broken up, and the surface water is allowed to pass off to the drains gradually, in place of remaining stagnant at the roots of the plants.

Woods, Nursery Grounds, Market Gardens, and Orchards.

The county of Mid-Lothian is very nicely and regularly wooded. The extent under plantation has increased much in twenty-five years, owing to the general improvement in land; numerous clumps of trees and belts of plantation having been laid off for shelter. The total area is 10,320 acres; and in West Lothian, 4719 acres. In both counties there are some well-wooded policies, which lend a charm to the landscape, and modify the monotonous appearance of the level portions. Edinburgh has more land under nursery grounds than any other county in Scotland. Indeed, it contains

one-third of the whole extent, the remaining two-thirds being very unequally divided between twenty-four other counties, Aberdeen, Ayr, Dumfries, and Forfar having by far the largest share. Linlithgow has a very small proportion, the area only amounting to 10 acres.

As a matter of course, Edinburgh exceeds all the other counties in market gardens, there being 775 acres under cultivation. Most of the produce is consumed in the city of Edinburgh. It consists chiefly of early potatoes, cabbages, turnips, strawberries, &c., for which there is always a ready offgate. Much manure is used for forcing, but the crops sometimes realise astonishing prices. Labour is, however, dear; and a great deal being required, there is not so much profit, after all incidental expenses are deducted, as a casual observer might imagine. Linlithgow has 14 acres under market gardens.

In the extent of land occupied by orchards, Edinburgh stands third, being exceeded by Perth and Lanark. The entire area devoted to fruit-trees is returned at 72 acres; but these figures by no means afford a fair criterion of the fruit actually grown. There is much produced in the market gardens as wall-fruit, and also upon standard trees and espaliers. A large quantity of the fruit raised is of fine quality, especially when the season is favourable for ripening.

We may notice that Haddington also contributes largely in the matter of fruit and vegetables to the Edinburgh markets. This has gone on for many years; and now that railways have facilitated the means of transit, a lucrative trade is pursued. The East Lothian market gardens occupy 306 acres.

Farming, Past and Present.

It is a pleasant feature in the farming of the two counties to notice the contrast between the excellent system observed at the present day and that carried on at the beginning of the nineteenth century, as handed down to us by history, or through oral tradition; not that very large tracts of land have been reclaimed in the low-lying districts within the limits of this report, because, as already stated, most of the land was previously in cultivation; but great advances have been made in the general system of cropping and land management. In the hill districts, many large stretches have been added to the area, and are now growing turnips and corn abundantly, where, of yore, was little save the heather and the heather-bell. In order to see as much as possible of the methods of culture now adopted, we made what may be termed two agricultural tours through the counties, guiding our footsteps into the best and worst districts, also keeping in view the following features—cattle-feeding, dairying, hill-farming, and lowland mixed agriculture. It was the haying season when we paid our visit, and

splendid weather; cereals were just assuming that beautiful golden hue which brings comfort to the farmer's heart, turnips were covering the drills, and bands of men and women were busy in the fields. We found the country delightful for a rustic ramble—here a clump of wood, there a purling rill—here a herd of pretty Ayrshire cattle, there a flock of mountain blackfaced sheep; while ever and anon the prospect changed from hill to dale—from cornfield to potatoes, turnips, or grass, and back to the cornfield again. Our starting-point was from Edinburgh, and the clock of the old Tron Church slowly struck eight on a lovely morning as we took our departure from “Auld Reekie.” Keeping the main road in a westerly direction, we duly arrived at the village of Corstorphine. The land in this locality is moderately level, the soil consisting mostly of a rich black loam, interspersed with patches of sand and clay. Much of the ground is laid out in well-cultivated gardens, which supply fruit and vegetables for the Edinburgh market. The country is nicely wooded, and contains many fine residences. The fields are carefully managed, and bear fine crops in rotation. Diverging a little to the south, we saw the generous farming practised by Mr Russell, Saughton Hall Mains, and that of his neighbour, Mr Dickson, who has long been a successful grower of turnips. Like many others in the locality, Mr Dickson ploughs in the fall, and grubs in the spring, as he finds this procedure to answer well for turnip culture. At Corstorphine Bank, Mr Sanderson farms about 400 acres well. He keeps six pairs of horses, and works his land with slight variations, on the ordinary shift. Mr Jack, North Gyle, has 300 to 400 acres, which appear to be in fine order; but as he was from home at the time of our visit, we did not succeed in obtaining any particulars of management. Proceeding onward in the direction of Linlithgow, our hap was to light upon Mr William W. Anderson, Norton Mains, who farms 400 acres. The soils upon this farm are various, some being heavy, and others friable, upon a stiff clay. He approves of subsoiling, whether heavy or light; and is a staunch supporter of deep culture. He keeps four pairs of horses; and in addition, adopts steam cultivation to a certain extent, which he finds of great benefit, especially the grubbing. His rotation is—1st, grass; 2d, oats; 3d, potatoes; 4th, wheat; 5th, turnips, sown with artificial manure, and eaten off with sheep where the land is strong; and 6th, barley. Most of the produce is sold off the land, and an equivalent in farm-yard manure purchased from the dairies of Edinburgh and Glasgow. Occasionally, a field is kept in grass three or four years. This season, 1876, Mr Anderson has thirty acres of potatoes growing in a field broken from the lea-furrow, which had previously been grazed four years, when the enormous quantity of 145 tons of eake, principally cotton, had been con-

sumed upon it! The fertilisers applied for the potato crop have been elsewhere alluded to in this report. A large dressing of farm-yard manure is allowed, in order that the land may be able to bear the two white crops which occur in the rotation. The rent of this farm is now about L.2, 15s. per acre, the advance being 10s. within a few years. Mr John Fortune has 345 acres at Ingliston. His straw is all made into manure. With this exception, he farms much in the same way as Mr Anderson. The wheat grown at Ingliston is the Square-head, a prolific variety; and the crops, at the time of our visit, looked promising. Within the past five years, labourers' wages have gone up fully L.10 per year in this locality. Ploughmen now receive an equivalent to L.1 per week. The whole parish of Kirkliston, a little further westward, is slightly elevated, and the soil varies from a rich black mould to a strong clay. There are also some small sandy tracts and parcels of light earth. The land was all limed one hundred years ago, and is still generously farmed, and produces good crops. It was in this parish that Lord Stair first introduced cabbage culture in the open fields. Rents are from 30s. to 45s. per acre, and some fertile patches bring a little more. Passing on to Ecclesmachan, the land is somewhat level and the soil good, being capable of growing in abundance all sorts of grain. At Three-Mile Town, Mr James Fleming farms about 200 acres in good style. He combines a commercial pursuit with agriculture, having a business in Glasgow. At Waterstone, in this parish, Mr John Cochrane occupies 230 acres under the Earl of Hopetoun. He is just entering upon a second 19 years' lease. The land is principally a stiff clay, and three pairs of horses are necessary to work it properly. He adopts the five or six course shift as circumstances admit, the rotation being—1st, oats; 2d, turnips and potatoes; 3d, wheat and barley; and the remainder in grass. Keeping a little further to the south, we enter the parish of Uphall. The soil in many parts consists of a rich workable clay upon till: in the low grounds it changes into a fine dark loam of first quality. With the exception of 210 acres occupied by natural pasture, and 180 by plantations, the whole of the parish is under the plough. Most of the land belongs to the Earl of Buchan. So recently as 1768 a large area was under, or divided by runrig. The agricultural state was then low, for the miscellaneous stampede of live stock in the autumn made sad havoc in the outstanding crops. There was then little fallow and a very small amount of artificial grass. The rent of the best enclosed land was at that time 30s. per acre; good enclosed, 25s. and the worst, exclusive of moorland, 8s. or 9s. In 1860, the average rent of the parish was L.1, 16s.; now it is about two guineas. The soil is mostly well cultivated. Mrs Flint occupies nearly 200 acres at Crossgreen, under the Earl of Buchan.

The Flints have been farmers in the parish for 300 years, and the present holding has been in their hands for thirty-one years. The soil being stiff, the following rotation is adopted:—1st, oats; 2d, beans, potatoes, and turnips; 3d, wheat or barley; 4th, hay; and 5th, grass. The extra manure is bought from a neighbouring dairy, and cattle are kept in winter to consume the straw. Potatoes are always liberally manured, about 40 tons of dung being applied with a little artificial to give the plants a start. Regents and Dalmahoy's are the varieties usually grown. The land has been mostly drained within the current lease, at the commencement of which 10s per acre was added to the rent. Retracing our steps to Three-Mile Town, and keeping to the north, we enter the parish of Abercorn. Here the scenery is strikingly picturesque, the seaboard being richly wooded, the fields highly cultivated, and in a fine state of fertility. The castellated mansion of the Earl of Hopetoun enjoys a commanding prospect, having on one side the blue sea, and on the other green fields, with the Pentland Hills in the background. The soil in this quarter is variable, but fertile. The substratum is still more changeable, consisting of patches of till, gravel, sand, limestone, and sandstone. So early as the 17th century, wheat was grown, rents being paid in considerable part by this commodity. What draining was required was mainly accomplished before the close of the 18th century, and a large extent of land planted and ornamented with clumps and belts of trees. The fields were also enclosed by stone walls and hedges. The Abercorn estate has long been famous in the annals of Linlithgow. It formerly belonged to the Grahams. Sir John Graham, who owned it in the 13th century, fell near Falkirk, in the war against Edward I. of England, on the 22d of July, 1298. But we must leave the memory of such scenes of strife and discord, and pass on to notice the high-class farming carried out in these more peaceful days. Entering the parish of Carriden, we find the surface of the county more unequal, the high lands culminating in the Irongarth or Glour-o'er-em Hills, which attain an altitude of 519 feet, yet are all enclosed and arable. Part of the soil is light and dry and part stiff and tilly, but the whole produces good crops of different kinds. At Walton, Mr George Davidson, who acts as factor for Admiral Sir James Hope, Carriden House, has 600 acres in his own hand. Different rotations are adopted to suit the character of the soil, but the most approved on the stiff clay is—1st, oats; 2d, beans; 3d, wheat; 4th, turnips; 5th, barley; and 6th, grass. Where the land is lighter, the following shift is observed:—1st, oats; 2d, turnips; 3d, barley; 4th, grass (hay, pasture, or both); and 5th, pasture. Beans and turnips are invariably grown on the heavy soils; potatoes and turnips on the lighter. Sometimes a very stiff field is bare fallowed, but this rarely occurs. He commonly gives his

potato land a deep furrow in the autumn, manuring partially on the stubble and partially in the drills in spring. It is grubbed next season, and works admirably. Mr Davidson finds that spring-manuring invariably gives the heaviest crops, but the autumn-dressed land produces the best quality of tubers, and the writer's experience is that they are not so liable to disease. Walker's Regents form the bulk of the crop, but a few Victorias are grown. The selling price is L.20 upon the ground. The land was thoroughly drained by the present tenant twenty years ago, the drains being laid down $2\frac{1}{2}$ to 4 feet deep, according to requirements. In cutting, a heavy drain plough by Alexander was used, twenty horses being employed to draw it. Afterwards, the cuts were cleared and the tiles laid. He, however, gave up this system in wet weather, as the trampling of so many horses poached the land so much that it was difficult to work and get into tid for a long time after. Throughout the whole of this parish, the crops yield tolerably well and produce a nice sample. Wheat reaches 32 to 36 bushels; barley, 40 to 42; oats, 40; and beans, 32 to 36 bushels per imperial acre. Potatoes weigh 6 to 8 tons per acre; swede turnips, 24, and common varieties, 18 to 20 tons. Nineteen years' leases prevail, almost without exception. After the Crimean War, a few prosperous seasons and a general uprise in produce caused land to be in great demand, so that rents ran up considerably, in many cases as far as 10s. to 12s. per acre. Recently, there has been little change, but the tendency is still to an advancement. Current rents are 34s. to 40s. per acre—in exceptional cases 50s.; but we do not hear that the latter figure is ever exceeded.

Taking the road again, we soon arrive at the old-fashioned town of Linlithgow. The land in the parish is somewhat hilly, but on the level tracts the soil is deep, fertile, and well-cultivated. Mr Wilson holds 200 acres of light soil at Lochend. He is just completing his second nineteen years' lease, and as his dairying interest is increasing, he is grazing more than formerly, some of the fields being three, four, or five years in grass. The farm has been much improved during the currency of the past lease, double fences having been uprooted, trees hewn down, drains cut and laid, and fields enlarged. A portion is cropped thus:—1st, potatoes from lea; 2d, wheat; 3d, oats; 4th, turnips; and 5th, barley, with grass seeds. The land is then left in pasture three to five years, according to quality and other circumstances. Twenty cross-bred cattle are kept for the dairy, the milk being all churned. The soil is rather free for wheat, but the sample is fine, and the crop sometimes reaches 5 qrs. per acre. The common rotation in the neighbourhood is—1st, oats; 2d, potatoes; 3d, wheat; 4th, turnips; and 5th barley, sown with grass seeds, which are mown or grazed the year following. Re-passing the town of Linlithgow, and holding on to a

south-easterly course, we arrive at the farms of Parkly and Riccarton, measuring together 360 acres. They are in the occupation of Mr John Wilson, and consist partly of arable land and partly of hill pasture. He has a nineteen years' lease, and has held his occupation a quarter of a century. The Earl of Selkirk is the proprietor. The rotation of cropping observed is—1st, oats; 2d, potatoes and turnips; 3d, barley or wheat; 4th, grass, partially mown; and 5th grass, wholly depastured. A good sample of wheat is grown, either of the white or Hunter's variety. The potato crop extends to 8 or 10 acres, and consists chiefly of Walker's early, the turnip crop being about equally divided between swedes and the common descriptions. The land is rented at 25s. to 38s. per acre in the neighbourhood, and has gone up 20 per cent. in as many years, but this is less than in some adjoining localities. Steam has been tried by Mr Wilson, and he approves of it vastly. The tackle employed is in the hands of a company. At Broomieknowes, Mr Peter Wilson holds 100 acres of arable land and 150 of pasture from the same landlord. He buys in 5 or 6 score of Cheviot ewes each autumn, and clears them out after taking one crop of lambs. In the summer season he grazes a few cattle upon the upland pasture, and feeds them off in the following winter. At Hillhouse, Mr Andrew West occupies 200 acres also belonging to the Earl of Selkirk. This is chiefly an arable farm, with a small extent of hill pasture, and his method of management does not differ materially from Mr Wilson's. Mr F. V. Harper, Bridge-end holds 400 acres from Captain Stewart, and farms on the four-shift course, as per agreement, viz., 1st, oats; 2d, green crop; 3d, white crop of some description; and 4th, grass. The soil is good but variable. Very little permanent stock is kept, Mr Harper buying in and selling out as he thinks desirable, so that his herds and flocks are, in the strict acceptance of the term, "flying" ones. The farm is nicely undulating, well watered, but perhaps too well wooded, as the plantations are a harbour for the wood-pigeon, which is an intolerable nuisance in this part, destroying turnips, clover, corn, and beans with impunity. The strict preservation of game, and its usual concomitant, the destruction of magpies, hawks, and the like, have been the means of increasing the number of wood-pigeons considerably of late years.

In this neighbourhood, a ridge of strong clay extends from east to west for a considerable distance. The farms situated upon it are mostly owned by the Earl of Hopetoun, and the occupiers, having lived long upon their several holdings, are not heavily rented. From 30s. for the worst, to 42s. per acre for the best, are about the usual rates. At Gateside, Mr William Robertson farms 282 acres, the soil being stiff and suitable for beans.

His rotation is—1st, oats ; 2d, turnips, potatoes, and beans, with a little in naked fallow ; 3d, wheat or barley, sown down with grass-seeds, and one or two years in grass, as the case may be. Sometimes wheat is taken after fallow, at others barley. The fields are of large size—18 to 20 acres—and well laid out. The high land is occasionally kept in pasture for several years, and sheep run upon it. Cross-bred cattle are fed in winter to consume the straw and turnips ; these often leave a handsome balance for their keep when sold off fat. Wood-pigeons and rabbits are much complained of. When we visited the farm, a stack of wheat was just being threshed, which was exceedingly deficient in kernel, owing to the destructiveness of the former. Mr John Robertson keeps a dairy of 25 to 30 Ayrshire and cross-bred cattle at Ochiltree Castle. The farm extends to 350 acres, and is the property of the Earl of Rosebery. He always drives the milk churned into Edinburgh three times per week in the summer, and once in the winter. At Wester Ochiltree, Mr David Flint holds 250 acres from the same proprietor. He also has a nice herd of dairy cattle, and drives his milk into Edinburgh.

Making now a zig-zag course in a south-westerly direction, we enter the parish of Torphichen, the surface of which rises in Cairn Maple to 1498 feet, being the highest point in West Lothian. The land is generally fertile, if we except a small tract of wet moor towards the extreme west. In the south-west it is likewise of a moorish nature, but of better quality. Some years ago, belts of trees were planted with good effect, as they not only beautify the scenery, but afford good shelter for stock. There is a nice lake in the parish covering an area of 22 acres. Perhaps one of the best farms is that occupied by Mr James Gardner, Hilderstone. It extends to 228 acres, and is all under the plough. The fourth or sixth shift is adopted, *i.e.*, 1st, oats ; 2d, potatoes or turnips ; 3d, barley ; and from one to three years in grass. Ten or 12 cross cattle are kept for dairy purposes, and the milk driven into Bathgate. About 30 cattle are also annually fattened on cake, straw, and turnips, thus leaving a good heap of manure for spring dressing. Clydesdale horses of the first stamp are reared, and long prices have lately been obtained for the surplus animals, reaching from L.70 to over L.100. No sheep are kept in summer, but two or three score of hoggets are wintered and sold off in the spring. In twenty years, Mr Gardner's rent has gone up L.60,—28s. per acre being the present rate of payment. Land in the vicinity varies from 20s. to 30s. Much has been drained and otherwise improved within the time named, both upon this farm and many others in the locality. The hedges, too, are far better kept than they were even a very few years ago. In the extreme south-west of Linlithgow is the farm

of Woodend, occupied by Mr Archibald McVicar. This holding extends to about 800 acres, and is principally hill-land, one-half of which is in permanent pasture. On the other section are grown—1st, oats; 2d, turnips and potatoes; 3d, white crop of some kind; 4th, hay; and pasture two years. Woodend is essentially a mixed farm. 500 to 600 blackfaced ewes are kept for breeding purposes. These are crossed with Leicester rams, and the progeny are always finished by the end of August. From 40 to 50 north Highland cattle are kept two summers, one-half being disposed of from October to November in each year to the butcher, and others bought in to fill their places. 13 pure Ayrshire cows constitute the dairy stocking, a bull of the same breed being used. 15 or 16 calves are reared upon the skim milk, butter being made from the cream. Passing several small farms on our way, we arrive at West Craigs, which is 300 acres in extent. Some of the land is hilly, and the rotation observed by the tenant (Mr James Mackay) is—1st, oats; 2d, turnips and potatoes; 3d, oats or barley, sown down with grass seeds; and three years in grass. For the soil and climate, this seems to be a suitable shift. About 42 bushels of oats and 50 bushels of barley per acre are considered fair returns. Some of the land is grazed as long as ten years. Cattle are fed in winter with straw and turnips, and cake is plentifully used for fattening. About 200 Leicester-Cheviot crosses are purchased in the autumn, clipped and sold off fat when the turnips have been consumed. Twenty Ayrshire cattle are kept, and their offspring reared and disposed of when ready for market.

Fancying we had seen enough of the mixed hill-farming in this district to enable us to give a faithful report of the agriculture as practised at the present day, we made good our way towards the east, passing through a charmingly diversified country, which is evidently cultivated with great care. Our next halt was at Seafield, made famous of late years by the honours won by the farmer, Mr John Meikle, in the pure Ayrshire cattle classes. He has a splendid array of silver medals, which his stock have taken at the Highland Society's and other shows. The farm consists of about 400 acres, and is held under a lease of nineteen years, from John Pender, Esq., M.P. The rotation is—1st, oats; 2d, potatoes and turnips; 3d, oats; 4th, hay; 5th and 6th, pasture. The quality of the soil here varies quickly. On one side of the main road leading east and west the land lets at L.1 to L.2 per acre; on the other, it only realises 15s. On Mr Meikle's farm, good oats can be grown weighing up to 44 or 46 lbs. per bushel, while the yield sometimes reaches 50 bushels per acre. The turnips raised are large and of good quality. The varieties are chiefly yellow Aberdeens and hybrids. The tenant has succeeded on two different occasions

in taking the medal offered for the best turnips in West Lothian. A short walk from this point brought us to Livingston Station, where we took train for Edinburgh, well pleased with what we had seen in a somewhat circuitous ramble. The line of railway passes through a nicely farmed country from Livingston eastwards, but the soil is extremely variable, and the rotations differ on almost every holding. The land is well wooded, but while the belts of plantation afford good shelter for stock, they also in some degree impede the progress of the plough, and prevent ventilation in the fields.

Our second outing did not extend beyond the county of Mid-Lothian, and, as in the former one, our attention was chiefly directed to the quality of the soil and the prevailing systems of cropping, with the addition of a few stray notes on other subjects thrown in *ad libitum*; so, in the second tour we mainly confined our attention to sheep farming and dairy management. As the particulars of several flocks and herds will be found under their respective heads in the body of the report, the notes are not so full here as they otherwise would have been. Taking the train to Currie, we alight in a delightful country, where the *utile* and the *dulce* are beautifully combined. The soil of the lower grounds is rich and under high culture, but the uplands are moorish. The rental of one or two farms has increased 700 per cent. in 150 years. Mr Walter Kidd, Balleny, has 50 Ayrshire cattle for dairy purposes. He has also been a wonderful land reclaimer, and his oats and turnips grown upon portions of the farm originally worth no more rent than 1s. per acre were simply excellent. At a little distance is the farm of Mrs Moffat, Kinleith, where a standing flock of 600 splendid Cheviots is kept. Proceeding along a mountainous route we arrive at Listonshiels, at the head of the water of Cockburn. Here Mr Aitken has one of the best blackfaced flocks in Scotland, and has long been a successful honour-taker. Mr Gray, Harper-rigg has also a good flock of this breed. Crossing an elevated tract of country—the high range of the Pentlands—we come to Penicuik. The parish bearing this name is extensive, being 11 or 12 miles in length by 6 in breadth. There is a variety of soils, consisting of clay, gravel, sand, and moss, with all their combinations, and the agriculture is as varied as the soil. Sheep farming, dairying, and cropping are carried on in all their moods and tenses, and to give a complete account of every branch would be to describe the methods on the generality of the holdings. There is not much wheat grown, but oats and turnips, with here and there a field of barley, seem to thrive well. Of the whole parish, about 8400 acres are in tillage, 1000 under wood, and the remaining 11,600 in mountain pasture or waste. During recent years a large area of once waste land has been reclaimed, and

now produces good crops, but the climate is only of a second-rate character in the higher reaches. At Mount-Lothian, a little to the south-east of Penicuik, Mr Stevenson has 300 or 400 Cheviot ewes. His land is part in moor, part in permanent grass, and the remainder arable. At Coates, a little to the north-west of Penicuik village, Mr James Fleming has a dairy of Ayrshire cattle numbering 70. Other dairies in the locality are those of Mr Macdonald, Spittal; Mr Noble, Howgate; and Mr Pate, Cross-house. Rents vary considerably. Some of the best land, capable of growing turnips, grass, and oats well, realises as far as L.2 per acre and upwards, while the worst is rented at only a few shillings. On our return journey we passed through the parish of Lasswade to Dalkeith. Lasswade contains some moorish, bleak, and unsheltered land in the south, but consists mainly of a fertile plain, well sheltered with timber. A large breadth of land has been reclaimed in twenty-five years; other extensive plots have been limed and dried by the cutting of open drains. In the locality are some nice gardens, producing strawberries and pot-herbs for the neighbouring markets. Three-fourths of a century ago there were as many as fifty Small's ploughs in the parish, and the march of improvement has never been suffered to lag. Cattle feeding, sheep farming, crop raising, and market gardening are all carried on in an industrious spirit. A few of the rents are very high, being as far as L.3 to L.4 for choice fields, and double for vegetable ground. At Hillend, Mr Ainslie has a fine flock of Leicesters, which have already been noticed. In the parish of Dalkeith the surface is beautifully undulating. The rent of the land is high, particularly that occupied by gardens. At the close of the last century, farms let at L.1 to L.1, 15s. and L.2 per acre, meadow land at L.3 to L.5, and gardens as far as L.5, 10s. Since then rents have gone up in common with other districts, the soil being fruitful, and there being a ready sale for the produce of both gardens and fields. Almost seven-eighths of the land belongs to the Duke of Buccleuch. His Grace has a nice herd of shorthorns at Dalkeith Park, which have recently risen into repute. His Leicesters also have acquired fame in sale-rings and show-yards.

A pleasant walk in the cool of the day brought us once more to Edinburgh. We were highly delighted with our rambles, as we had had ocular demonstration of what can be done in a country possessed of a fairly productive soil and good agricultural capabilities in general, when peopled with a persevering class of tenantry. We visited several other farms in the neighbourhood of Edinburgh, as well as in the east and south-east of Mid-Lothian, but we need not enter into the particulars of management, as they differ little from those on many farms already described.

Other Sources of Industry.

Before drawing our report on the agriculture of Edinburgh and Linlithgow to a close, we may just briefly refer to other sources of industry which give employment to no inconsiderable part of the population.

Mines and Quarries.—The counties are both rich in minerals. Coal has been wrought in some localities for a long period. In the parish of Lasswade, Mid-Lothian, collieries had been opened about the beginning of the 17th century, and history informs us that in the county of Linlithgow several mines were worked as early as the reign of Alexander III. About forty years ago, the annual average amount of coal produced in West Lothian was 44,000 tons, but within twenty years after, it had vastly increased, and now is far beyond that limit. It may here be stated that the coal-fields of Scotland are divided into an eastern and a western district. In 1866, the former, which includes Edinburgh and Linlithgow, contained 254 collieries and 21,200 miners, being an average of about 83 workmen to each colliery. The total amount of coal raised was 6,100,000 tons, or an average of 287 tons to each miner. The quantity of coal annually raised in the valley of the Esk a few years ago was said to yield a royalty of £12,000 to the proprietors of the mines. In this locality are 15 collieries, the coal-bed being 15 miles by 8 in extent. A large portion of the produce is shipped coastwise at Musselburgh. Coal is extensively wrought at Vogrie, in the parish of Borthwick, and yields a large annual revenue. The aggregate quantity shipped from Leith and Granton during 1875 was in—

January,	24,470 tons.	July,	49,176 tons.
February,	18,265 „	August,	53,895 „
March,	24,046 „	September,	53,707 „
April,	34,322 „	October,	41,661 „
May,	38,153 „	November,	37,031 „
June,	45,538 „	December,	43,502 „

These figures give a total of 463,766 tons, or a little more than one-thirtieth part of the whole amount raised in both the eastern and western districts of Scotland. Coal mines may be said to have gone up in value 30 per cent. in ten years, and 40 to 50 in twenty or twenty-five years. The mining population are mostly well-behaved and industrious, but like too many of the class to which they belong, are somewhat improvident in their habits. When wages were at their height three years ago, and from 8s. to 10s. or even 12s. per day could be made, very few saved any portion of their earnings; consequently, little, if any money is laid by in ordinary times, and a period of depression is too often marked by privation and suffering. In 1852, wages were about

2s. 6d. per day; in 1862, 5s.; and in 1872, 10s., so that ten years saw them doubled; twenty years, quadrupled. Rates at present, however, are not much in advance of what they were in 1862; indeed, in many cases 5s. per day is not reached; and as we write, the prospects are not of the brightest.

Limestone is pretty widely diffused throughout both counties. It is particularly abundant in all the coal districts. From the earliest days of agriculture, large quantities of lime have been burned in Hemperston, Middleton, Vogrie, and Arniston. At Crichton-Dean, Cranston kilns, 24,000 bolls were a few years ago annually sold, the kilns at Cousland producing 16,000 bolls. The most abundant strata are at Gilmerton, in the parish of Liberton. In Abercorn parish, Linlithgow, the value of raw produce, including coal, whinstone, and limestone, was, in 1843, estimated at L.22,700. Since the more general use of artificial manure and extraneous feeding stuffs, lime as a land fertiliser has not been so extensively used; but it is the opinion of many agriculturists that much of the soil in both Edinburgh and Linlithgow would be benefited by a good dose.

Sandstone is abundant, and the quarries add much to the wealth of the country. One at Hailes yields a slaty stone which is easily worked, and very suitable for pavements. Another at Redhall, a few years ago, brought in a rental of L.11,000. From a quarry at Craigeith most of the beautiful and durable stone of which the New Town of Edinburgh is built was obtained.

At Clermiston, and other places, inexhaustible quarries of trap or blue whinstone are worked. This is very valuable, not only for building purposes but also for road-making, being exceedingly hard and lasting.

Ironstone, too, is largely developed in some parts. The working of a band in Whitburn, Linlithgow, some twenty-five to thirty years ago, provided a large means of local industry, and resulted in changing the aspect of a bleak, lonely, and barren moor into a scene of activity. This band yields from 27 to 30 per cent. of pig iron, and has proved a profitable working. Iron is still wrought in several parts, and adds much to the proprietors' revenue. Ironworks have advanced quite 25 to 30 per cent. in twenty years. In 1875, the quantity of pig iron exported from Leith and Granton was 160,161 tons.

Firebricks are rather extensively made in some localities, and besides supplying a large home demand, quantities are occasionally shipped to other parts.

Manufactures.—Neither Edinburgh nor Linlithgow occupies a very important position with regard to manufactures. Linen is made at Edinburgh, Leith, and Musselburgh, but not to any great extent. About 4000 hands are employed in the paper manufacture, which is chiefly carried on at Colinton, Penicuik, Currie,

Lasswade, Balerno, Auchendinny, and some other places on the rivers Leith and Esk. A silk mill was erected on the banks of the Union Canal, a little to the west of Edinburgh, in the year 1835, but the speculation did not turn out so successfully as the promoters expected. In the town of Bathgate, about 600 to 800 hands are employed in the paraffin works of Messrs Meldrum. Printing and publishing are carried on in Edinburgh perhaps to a larger extent than in any other town in the United Kingdom, London excepted.

Fishing.—A small portion of the population residing along the banks of the Forth still obtain their livelihood, either wholly or in part, from the sea, but the fisheries are by no means extensive when compared with those of some districts along the eastern seaboard of Scotland. Cured fish are exported to Germany, Holland, Russia, and other countries.

Shipping Interests.—These are well represented by the seaport towns dotted along the estuary of the Forth, particularly by Leith, which has a foreign and colonial trade with Russia, Holland, Denmark, Sweden, Germany, East and West Indies, America, China, and Australia, besides a considerable coasting trade. In 1692 the shipping comprised 29 vessels, of 1702 tons in the aggregate; in 1855, 168 sailing vessels, of 19,067 tons, and 25 steam-vessels, of 6327 tons. In 1859 the customs revenue amounted to L.572,872. The total value of exports in 1859 was L.872,973. Since then both the export and import trade have increased. The chief exports are coal, iron, firebrick, and paraffin; the imports, grain, tallow, timber, and live stock. In 1875 the principal imports of grain were:—wheat, 2,248,589 cwt.; barley, 652,930 cwt.; oats, 363,117 cwt.; rye, 69,465 cwt.; beans, 167,669 cwt.; pease, 116,467 cwt.; Indian corn, 351,345 cwt.; and flour, 254,005 sacks.

The seaport of Borrowstounness, or Bo'ness, enjoys a little trade. About the end of the 17th century it ranked next to the port of Leith. The number of vessels which entered the port in 1870 was 390, representing a burthen of 41,851 tons, and the clearances 1420, or 157,577 tons. Coal is the chief article of export.

Shipbuilding is carried on at Leith pretty extensively, and the yards have turned out some very fine steamers and sailing vessels.

ON THE AGRICULTURE OF THE COUNTIES OF ROSS AND CROMARTY.

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General and Introductory.

THE counties of Ross and Cromarty are so thoroughly dovetailed into each other geographically, and so intimately connected politically, that they are usually spoken of as one county, and in this treatise we propose to abide as closely as practicable to this convenient rule. Together the two form the third largest county in Scotland, and extend in one grand whole from the German Ocean to the Atlantic; while separately both are cut up, unconnected, and incomplete.

These combined counties are bounded by the German Ocean on the east, by the Atlantic Ocean on the west, by Sutherlandshire on the north and north-east, and on the south by Inverness-shire. The island of Lewis, which stands away out about 30 miles from the mainland, forming a huge natural breakwater to check the rolling waves of the Atlantic, and a few smaller islands, also on the west coast, belong to Ross-shire. The most northern point of the mainland, at the mouth of the rivulet Fin (meaning boundary), is in north latitude $58^{\circ} 7' 20''$; the most southerly, near Loch Luing, in $57^{\circ} 7' 49''$; the most easterly point, Tarbetness, lies in west longitude $3^{\circ} 45'$; and the most westerly, in the north of Applecross Sound, in $5^{\circ} 46'$. The greatest distance in a straight line from north to south is close on 70 miles, and from east to west about 67 miles. From north-east to south-west Ross-shire extends 84 miles. According to the census of 1871, the area of the two counties is about 3151 square miles, or 2,016,375 imperial acres. Cromarty claims 19,247 acres, and Lewis 417,416.

In 1871 the population of Ross-shire was 77,593, and the number of inhabited houses 15,028. In Cromarty the population was 3362, and inhabited houses 685; together, population 80,955, inhabited houses 15,713. The Parliamentary Return of owners of lands and heritages in Scotland, drawn up in 1872-3, shows that in Ross-shire there are 324 proprietors of lands of one acre and upwards in extent, whose total acreage is 1,971,309, and total annual value £247,833, 17s.; and that there are 1719 owners of land of less than one acre in extent, their total extent being 373 acres, and total annual value, £21,508, 3s. The total number of landowners is thus 2043; their total acreage 1,971,682 acres, and their total annual value, £269,342. In Cromarty, according to the same authority, there are in all 231 landowners; 217 having each less than one acre. The total annual value of

the lands of these small owners amounts to L.1966, 7s. The 14 owners of one acre and upwards hold among them 718,184 acres, the total annual value of which is L.10,268, 1s. The Valuation Roll for 1876-77 shows that the gross annual value of the county of Ross, exclusive of railways and royal burghs, is L.252,908, 10s. 9d.; that the annual value of burghs is, L.14,886, 0s. 6d. (Dingwall, L.6,922, 15s. 3d.; Tain, L.4744, 5s.; and Fortrose, L.3219, 0s. 3d.); and that the annual value of railways is L.21,268; grand total, L.289,060. 11s. 3d. The valuation of the county of Cromarty, exclusive of the burgh, for the year ending 1876-77 is, L.9909, 12s. 6d.; burgh of Cromarty, about L.1900; total, L.11,809, 12s. 6d. The valuation and area of Cromarty, quoted above, do not include the detached portions of the county (about 20 in number), which are scattered throughout Ross-shire. These portions are estimated to extend to about 182,000 acres, of which the Duchess of Sutherland owns 149,800 acres, and for valuation and all practical purposes they are considered as part of the county of Ross.

According to the Board of Trade Returns for the present year (1876), the number of acres under all kinds of crops, bare fallow, and grass, was 124,826 acres; wheat, 6019; barley or bere, 10,461; oats, 29,509; rye, 1192; beans, 86; peas, 146; total, under cereals, 47,413. The acreage under green crops was—turnips, 17,126; potatoes, 9256; mangold, carrots, cabbage, &c., 63; tares, &c., 814; total, 27,259. Grasses under rotation extend to 29,987, and permanent pasture (exclusive of heath and mountain land), to 19,395; and bare fallow, or uncropped land, to 772 acres. Of the 1,891,549 acres in both counties, exclusive of the area under "all kinds of crops, bare fallow, and grass," about 600,000 are under red deer, and 1,291,549 under sheep, wood, or water, &c.

Ross-shire is divided into 32 parishes, several of which are small, several very large. The two counties are united into one sheriffdom, the sheriff principal having three substitutes. One substitute sits at Dingwall and Fortrose, one at Tain, and another at Stornoway, in Lewis. They are also politically united, and the present representative is Mr Alexander Matheson of Ardrross. For civil purposes they are divided into five districts, viz., The Black Isle, Easter Ross, Mid-Ross, Wester Ross, and Lewis. The burghs of Dingwall, Tain, and Cromarty are joined with Dornoch, Wick, and Kirkwall in Parliamentary representation, the present representative being Mr John Pender. Fortrose is united with the Inverness District of Burghs, which are represented by Mr Fraser Mackintosh.

There are four royal and parliamentary burghs in the two counties—Dingwall, Tain, Cromarty, and Fortrose; two seaport towns—Invergordon and Stornoway; and close on a score of villages, the more important of which are Alness, Portmahomack, and Ul-

lapool. Dingwall is the county town. It was created a royal burgh by Alexander II. in 1227, and has now a population of 2125. The beautifully wooded plain upon which it stands was once a swampy marsh, but thorough drainage and spirited agriculture has made it one of the most lovely valleys in the north of Scotland. The burgh lies snugly among rich clumps of handsome trees at the entrance of the Strathpeffer Valley, famous all over the kingdom, and even beyond it, for the healing powers of its sulphurous springs. The scenery around the "strath" is very fine, the air pure and dry, and for several years past it has been one of the most fashionable summer resorts in Scotland. The junction of the Highland and Dingwall and Skye Railway is at Dingwall, and a short canal from the Cromarty Firth enables small vessels to reach the town. The town mainly consists of one street, about a mile in length, and while the majority of the houses are irregularly situated and unpretentious in an architectural point of view, still there are a good many very handsome residences, most of which have sprung up within the past twenty-five or thirty years. Traces of what was once the principal seat of the Earls of Ross are seen close by, while in the neighbourhood there is a vitrified fort on a conical hill. The Caithness, Sutherland, and Ross Rifle Militia have their head-quarters at Dingwall.

Next in importance comes Tain, situated on the south shore of the Dornoch Firth, and containing a population of 2287. It was created a royal burgh by Malcolm Canmore, and about the beginning of the thirteenth century St Duthus, its patron saint, and Bishop of Ross, constituted it the ecclesiastical capital of Ross-shire. The tower in the Town House is very ancient, and the bell which hangs in the freestone spire that surmounts it is about 200 years old. This interesting structure is now encircled by a very handsome Town's House. On a beautiful level between the town and the firth stand the remains of a very ancient chapel, said to have been erected to the memory of St Duthus about the close of the thirteenth century. It is recorded that in this chapel the wife and daughter of Bruce took refuge, but the Earls of Ross are credited with having "dragged them forth and given them up to the English." It is also said that James V. made a barefoot pilgrimage to this ruin in 1527. Close by the town's house are the well-preserved ruins of a collegiate church, founded in 1471, and remarkable for its beautiful Gothic architecture. The streets are very irregular, but still the town has a cleanly likeable appearance.

Cromarty has a population of 2180. It is situated at the north-east corner of the Black Isle, and has very pretty surroundings. Sir John Sinclair and other sages predicted that Cromarty long ere now would have become one of the principal centres of commerce in the north of Scotland, and though, unfor-

tunately, those good predictions have not been realised, Cromarty is still a little burgh of considerable note. It is well known to have one of the safest harbours in Europe. Two immense headlands, called the "Soutars," form natural breakwaters against the tide in the Moray Firth, and between these headlands, which are distant from each other only about a mile, the Cromarty Firth steals away round to the back of the Black Isle almost unobservedly and quietly even during the roughest seas. Ships once into this firth are safe from all seas, and often during a storm the firth is crowded with vessels of various sizes. A fine quay was formed at Cromarty in 1785. Cromarty is famous in another way. It was the birthplace of Hugh Miller, and it may well be pardoned for the pride it feels in ranking this eminent geologist as one of its illustrious sons. A monument to the memory of Hugh Miller stands in the neighbourhood.

Fortrose is formed of two towns—Rosemarkie and Chanonry—and has a population of 911. Rosemarkie was created a royal burgh by Alexander II. A cathedral and bishop's palace once adorned Fortrose, but Cromwell destroyed both, and sent the stones to Inverness to be used in the construction of a fort there. Fortrose has still a very fair trade, and in the sixteenth century it gets the credit of having been the seat of arts, science, and divinity in the north of Scotland. The beach here is sandy and very beautiful.

Invergordon is a thriving seaport town, with a population of about 1157. It is situated on the north-west side of the Cromarty Firth, and has long been the chief seaport for the eastern districts of the county. Mr Macleod of Cadboll erected two wooden piers at a cost of about L.5000. For many years Invergordon was the only town in the county that could boast of a newspaper, the "Invergordon Times," but about a year ago the "Ross-shire Journal" was started in Dingwall.

Stornoway, the only town in Lewis, has a population of about 2498, and is of considerable importance in the shipping trade. It has been immensely improved of late by Sir James Matheson, Bart. of Lewis. A lighthouse stands at the harbour mouth.

Ross-shire embraces all the varieties of Highland scenery; and more than that, it can boast of not a few of the most charming characteristics of the finest agricultural districts both in Scotland and England. In the Highlands, or western division of the county, wood, water, heath, and mountains mingle together in perfect grandeur; while in the eastern or lower lying districts, green fields, thriving hedges, rich plantations, and handsome houses tint the landscape into delightful harmony. The scenery in Easter Ross, and around Dingwall and Strathpeffer, is really very fine. Almost all the arable land lies on the east coast; and the main body of the county, lying to the west of the fine agri-

cultural border on the east, is extremely mountainous and wild. The hills and mountains are chiefly in clumps or chains, and in many cases they reach to a great height. Ben Wyvis is probably the finest mountain in the county, though other two or three exceed it in elevation. Ben Dearg, Ben Alton, and Ben Sloich are each close on 4000 feet high, while Ben Wyvis is only 3700. The west coast is exceedingly rugged and winding. In a straight line the west coast of Ross-shire measures only about 70 miles; while by following the indentations, the length extends to something like 400 miles. The number of lochs and small lakes in the two counties is extraordinary. A large number are small, but still a few are of a considerable size. Chief among these may be mentioned the beautiful Loch Maree, which extends to some 18 miles in length, and which is surrounded with as delightful mountain scenery as is to be met with anywhere in Scotland. The mountains rise on both sides almost perpendicularly, and are fringed at the base with rich plantations of larch and fir. The tops of the mountains are bare and water-worn; but "about half-way down [says a recent writer], the combined beauty and sublimity of the scenery are such as to strongly affect the dullest imagination; and when we come in sight of the little island towards the lower end of the loch, the picture may be said to be complete—a picture which, we venture to say, puts fairly into the shade the much-vaunted beauties of the Trossachs and of Lochlomond." The majority of these lochs are well stocked with fish of various kinds; and on the whole, very few counties equal Ross-shire in the facilities it affords the lovers of the "gentle art." The rivers are numerous, while the small streamlets and mountain torrents can be counted in scores. The principal rivers on the east coast are the Carron, the Conan, and the Alness; the latter two drain a great portion of the southern division of the county, and fall into the Cromarty Firth; while Carron drains a considerable extent of the northern end, and empties itself into the Dornoch Firth at Bonar Bridge. On the west coast the largest rivers are the Ewe, another Carron, and the Broom. The river Ewe flows out of Loch Maree, falls into the sea at Loch Ewe, and is considered one of the best angling streams in Britain. Salmon and sea-trout are abundant; and it is recorded that the former average about 16 pounds in weight. On the other rivers generally the supply of salmon and trout is very good, and the quality of the fish is excellent. The large majority of the lochs and rivers are reserved by their owners, or let to angling tenants; but still there is abundance of fishing at the command of the tourist.

Ross and Cromarty stand supreme with respect to grouse-moors, and deer forests. The latter are numerous, and some of them very large; the total breadth under deer, as already stated,

being about 600,000 acres. Several of these forests carry excellent covers of deer, and afford grand sport to their owners or tenants. Complaints, however, are occasionally heard that the animals are not coming up to the former standard of weight, but are small in size, and always lean. An authority on the subject says, "this might be cured by the infusion of fresh blood, which is known to be the backbone of all good breeding." The grouse moors are not only numerous, but also large, and very productive, though, of course, the destructive disease which raged with such virulence in 1874, thinned the stock of birds dreadfully.

A premium is presently offered by the Highland and Agricultural Society for a report on the woods and forests in Ross-shire, and therefore many notes on the subject here would be out of place. It may be remarked, however, that the breadth under wood in the county is very great, and that many thousands of acres have been added to it during the past ten or twenty years. Wood seems to thrive exceedingly well in the county, and is found to be a most remunerative speculation. One instance of this may be given. A plantation on the estate of Tulloch was recently disposed of, and the sum realised was equal to a rent of L.2 per acre for each of the forty years the wood occupied the ground. The benefits conferred on a cold late district by plantations are well known to be very considerable; and in these days of dear labour and high prices for wood, the landed proprietors in some of the other counties in the north of Scotland would do well, both to themselves and to the community generally, were they to copy the good example shown in the way of planting by the proprietors of Ross-shire. There is one little point, however, that the proprietors of Ross-shire would do well to look at, in the interests of their valuable plantations. That little lively creature, the squirrel, is well known to be a destructive enemy to young trees. It gnaws away at the "leaders;" and in this way a single squirrel has been known to kill or greatly damage no fewer than a dozen young trees in one day. Several of the young plantations of Ross-shire are swarming with these creatures; and in their own interests we would advise the landed proprietors to combine together and exterminate them. Singly, very little could be done, but were the owners of all the plantations in the county to unite in their destruction, their little foes would speedily disappear.

The island of Lewis has been aptly described as an immense peat, with notches of the moss cut away here and there, to afford a sure foundation for the inhabitants, and also produce food for their bodily wants. It lies from $58^{\circ} 11'$ to $58^{\circ} 31'$ north latitude, and from $6^{\circ} 9'$ to $7^{\circ} 8'$ west longitude. The Flannel Islands, belonging to Lewis, lie in $7^{\circ} 39'$ west longitude. The highest hill is 1850 feet above sea-level; a few hill tops are

nearly this height, and there are a few more from 1000 to 1600 feet; but the largest extent of surface of the island is under 600 feet. The arable land, and the best pasture round the sea-shore, seldom rises beyond 200 feet above the sea. Lewis is divided into four parishes—Stornoway, Barvas, Lochs, and Uig. Stornoway is the smallest in extent, containing only 67,650 acres, but it is by far the most important of the four, embracing, as it does, not far short of the half of the whole population of the island, and standing equally near the same position in respect of rental. Naturally, the land is divided into three sections. At the north-eastern end there is a large extent of mostly flat land (the highest hill here being 800 feet), with a considerable depth of gravel under the moss and between it and the solid rock. This section forms a triangle, the base of which is a line drawn from Bayhead, Stornoway, across by the east end of the Barvas hills to the mouth of the Arnal river on the west coast, the perpendicular being a line from Arnal to the Butt of Lewes. The town of Stornoway stands on the south corner of this triangle, and the Butt of Lewis on the north corner. Lewis Castle and grounds, so greatly admired by all, stand just outside the base line where it started at Bayhead. The finest grazing and arable land in the island is in this section; and more than half of the population live on it. The middle section of the island runs from sea to sea, and lies between the two parallel lines from Stornoway to Arnal on the one side, and from the northern corner of Loch Erisort to the east corner of Loch Roag on the other side. Much of this tract of land is also flat, but still it contains a good deal of land with an undulating surface, and two ranges of low hills, the highest peak of which is about 1000 feet. The rock comes very close to the surface in some parts of this section; in others it is bare altogether, while in the hollows it is covered with moss to a great depth. On the south edge of this division stands the only inland crofter township in the island; and along the north side there is a large population from Cal-larnich to Arnal. The west and south-western portion is very rocky and hilly; and here are the highest hills and wildest scenery in the Lewis. There are also some large fresh water lochs, as well as the extensive salt-water lochs of Roag, Erisort, Shell, and Seaforth. On the west side of this section are a number of rocky islands, large portions of the surface of which are covered with the richest, natural grasses. Cattle and sheep thrive better on these islands in winter than on any other part of the Lewis. Opposite this division, and between Lewis and Skye, are the Shiant islands, on which are first-class natural grasses, which winter several hundreds of Cheviot sheep as well as any of the runs in the lower parts of the county. With the exception of these islands, and some other pieces of

good grass and mixed pasture, round low hills, knolls, and loch sides, the greater part of this section is covered with black heath and boggy pasture, and a good deal is simply bare rock. There is very little land here on which the plough could work; but owing to the suitability of the sides of the sea lochs for the home of the fisherman-crofter, about one-fourth of the crofters in the island live along the sea-shore on this section. In a word, it may be said that the distinguishing features of Lewis are its large extent of moss and moor, its immense number of lochs, and the thousands of crofters that live on it.

While Ross and Cromarty rank very high among other Scotch counties in regard to their sporting importance, they also occupy a most creditable position in an agricultural point of view. The county of Ross surpasses almost all other counties in Scotland in one feature—it has within its bounds one of the best purely arable districts in the kingdom, and also as large and as fine a purely pastoral range as is to be found anywhere in the northern counties of Scotland. In the eastern division “nature has done much to enrich the soil and adorn the landscape;” and the long-sustained and united exertions of an intelligent, enterprising, liberal class of landlords, and of a painstaking energetic race of tenants, have made that part of the county a formidable rival to the Lothians and to the plains of Morayshire. Easter Ross proper has long been well known as a perfect garden of richness and fertility. The climate is good, the soil excellent, and the prevailing system of farming of the most advanced description. Away in the western districts again we find purely pastoral farming flourishing at an equally prominent stage of advancement. The range under sheep is immense, the pasture in many parts very good, and the system of management pursued quite abreast with the times—if not indeed in advance in some points. That the past quarter of a century (the period over which this report extends) has contributed very largely to the attainment of this prominent position these counties now occupy there can not be a doubt; and of this more anon.

Probably nothing has been more instrumental in bringing the counties of Ross and Cromarty to what they now are, than the improved means of conveyance both by sea and land. Without proper outlet no county, however rich its natural resources, can do much in the way of developing its industry, or at least could benefit to any great extent by attempts at improvement; and like most of the other northern counties, Ross and Cromarty were for a very long time greatly handicapped in this respect. The districts immediately round Cromarty and Invergordon have for many years been benefited by an outlet by sea, but the further inland parts lay neglected for many years. Even to Inverness-shire, its nearest neighbour, the county of Ross seems to have remained

almost a stranger for many hundreds of years. Little more than a century and a half ago the magistrates of Inverness, anxious to know something of their hitherto unknown neighbours at Dingwall, despatched a deputation of their number to “explore the town, interview the inhabitants, and report.” In the course of “a few days” the deputation returned with the news of their expedition; and we believe their formal report is engrossed in the Council Records of Inverness. Dingwall is now about an hour’s ride from Inverness. Verily we live in changed times!

Regular communication between Ross-shire and the south by sea was established in 1839, when the steamship “Duke of Sutherland” began to trade in the Moray Firth, sailing between Leith, Inverness, and Invergordon, and calling at all the intermediate ports, going and coming, which occupied about a week. Some time after that two steamers began to sail from Invergordon once a week, but since the extension of the Highland Railway into the county there has been scarcely any regular communication by sea. A steamer sails from Leith to Cromarty, Invergordon, and Inverness, through the Caledonian Canal to Liverpool once a fortnight. In 1862 the Highland Railway was opened into Invergordon, and two years later or thereby it was extended to Tain and Bonar Bridge; and now it runs right through to Wick and Thurso, allowing the blood of commerce to circulate freely from Land’s End to John O’Groats. The benefits conferred on the whole north by the efficient railway communication it now enjoys have been almost incalculable.

Population, &c.

The following table shows the population at various periods since the beginning of the present century:—

1801,	53,525	1851,	82,707
1811,	60,853	1861,	81,406
1821,	68,828	1871,	80,955
1841,	78,685		
	Increase since 1801, . . .		27,430
	Decrease since 1851, . . .		1,752

It will be seen from these figures that, while the population has increased largely during the present century, the past twenty-five years have diminished that increase very considerably. The attractions for emigration, the extension of sheep-farming and deer forests, the absorption of crofts by large farms, and the high rate of wages in the southern counties of Scotland, have all been mentioned as active agencies in bringing about this decrease; and doubtlessly they have all had something to do in the matter. The number of inhabited houses in 1851 was 15,941; in 1861, 15,728; and in 1871, 15,713—decrease, 228. The parliamentary constituency in 1855–56 was 879, and in 1875–76, 1580. The present population is equal to only about one person for every 25

acres; and the average number of persons to each house is from 5 to 6. The most ancient inhabitants of Ross-shire, as of Scotland generally, were known by the name of Caledonians, but whether they were Celts of the Cymric (or Kymric) or Erse branch is still an undecided fact. History tells us that the Scots, that hardy race of Celts that peopled the "Emerald Isle," when it was known, not as Ireland, but as Scotland, emigrated to this country, and after the third century occupied the western coast of Scotland, from the Firth of Clyde to the northern boundary line of Ross-shire. Like those of almost every other county in Scotland, the early inhabitants of Ross and Cromarty were frequently disturbed by ambitious and warlike invaders. The Romans, in their wild depredations in Caledonia, seem to have stopped short before reaching the northern straths of Ross-shire; for, with the exception of the discovery in a mound near Tarbetness of a few Roman coins, a rusty sword, and a few other articles of Roman fashion, no traces have been found of their having been in the county at all. From the few Scandinavian names that occur in Easter Ross, such as Tain and Dingwall, it is evident that the Norsemen, who had taken possession of the county of Caithness, had penetrated into Ross-shire and planted their abodes in the richest parts of the county. The Danes also invaded the county, but neither they nor the fierce men of the north were able to retain their hold for any length of time. The natives rose in rebellion as one man and drove the invaders from the county. For his heroism in these conflicts Munro of Ferindonald had all the lands lying between Dingwall and Alness water bestowed upon him by Malcolm II. On Cromarty Hill Wallace is said to have fought and won an important battle against the English, while the conquering hand of Cromwell left its print at Fortrose, where, as already stated, he destroyed a fine cathedral. Probably the most important of all the battles known to have been fought in the county was that between the armies of the gallant Montrose and the Commonwealth, which was fought in 1650 at Craigeaomeadharn, in the parish of Kincardine. Here Montrose sustained a dreadful defeat, and having been captured, he was conveyed to Edinburgh and executed. Much as the county suffered from the battles which were necessitated by the ambitious interference of foreigners, probably quite as much bloodshed was caused, and as much damage done to property, by unfortunate feuds which were every now and again breaking out among the native rival clans. For several hundreds of years, however, the social atmosphere of Ross-shire has been clear and tranquil; and since the beginning of the sixteenth century the county has been gradually moving onwards in the van of progress. Just about the time the Danes and Norsemen were perpetrating their wild outrages against the untutored natives of the East, a band of monks from Iona, and headed by

St Malrube, with more peaceful purpose landed on the west coast among the Applecross Hills; and at Boat Cove, in that district, they founded a monastery, which, says a recent writer, "shed the first genial rays of Christianity over the heathenism of the West." The centre of the Christian colony then formed is still distinguished by a stone cross; while it is said by some that the remains of an old burying ground, which are seen in one of the small islands of Loch Maree, mark the spot where the good St Malrube lived and died. From this they argue that Loch Maree took its name from St Malrube. It is more probable, however, that the name of this magnificent sheet of water was derived from a St Maree, who came direct from Iona and took up his residence in one of the small islets at the north end of the loch.

Since the advent of the present century the social condition of the people throughout the counties generally has improved very much indeed. The working class are better fed, better housed, better educated, and better remunerated for their labour; and, on the whole, it must be said that the working population of Ross and Cromarty is in a very satisfactory and comfortable condition. The educational machinery in several of the districts on the west coast and in Lewis was for long very inferior and incomplete—a Gaelic teacher, with a salary of L.15 or L.20 a year, being the only educational luminary some of the parishes could boast of. The Education (Scotland) Act, however, has supplied all these wants, and, with such liberal encouragement as is now given by Parliament, education in the Highlands should soon reach a very different degree of quality from that at which it has for so long been stationary. A large number of very fine new schools have been built throughout the counties during the past two or three years, and a whole host of highly certificated teachers have been introduced. The landlords of Ross and Cromarty are thoroughly intelligent, liberal minded, practical men, many of them enthusiastic agriculturists; while the farmers, generally speaking, are shrewd, independent, industrious, and painstaking. A good deal of southern blood has been infused into the eastern districts during the past fifty or sixty years, by far the majority of the larger arable farms in the counties, as well as a good many extensive sheep runs, being held by gentlemen hailing from the south or south-eastern counties of Scotland. The natives are quiet, easy-going, kind-hearted, contented people, of high moral character, and very fair intelligence. Gaelic, broad Scotch, and the purest of English are all heard in curious confusion in every district of the county. In Easter Ross the labouring classes only speak Gaelic, but on the west coast the Celtic language still stands supreme. Many hundreds of the natives in fact cannot speak a single word of

English, though the young people have for a few years been regarding it as an essential branch of their education to become acquainted with the English language. The Gaelic schools, of course, have been undermined by the Education Act, but still, so fondly do some of the more clannish of the inhabitants lean towards the language of their own early youth and of their forefathers, that a good many of the old Gaelic teachers have been reinstated in small temporary schools, old grain barns and the like. Ross-shire has a large battalion of Rifle Volunteers, while Stornoway and Cromarty have each an Artillery battery. The two counties also contribute largely to the Caithness, Sutherland, and Ross Rifle Militia.

Climate.

When the high northern latitude is taken into account, the climate of Ross and Cromarty must be regarded as most wonderfully mild. It varies a good deal in the different districts, being dry and mild on the east coast and very moist on the west. The mean annual temperature over the whole of both counties which has been put down at 46° , varies very little, but the duration of summer heat on the east coast is greater than on the west coast; where, on the other hand, the winters are slightly warmer, but, in the northern parts at least, marked by heavier falls of snow than on the east. The mean temperature in the Lewis of the four months—November, December, January, and February—is about 39° , and that of the other eight months about 49° . The rainfall in the west usually ranges from 35 to 70 inches, in the Lewis from 30 to 50 inches; and in the east from 20 to 30 inches. This remarkable difference in the rainfall between the east and west coasts is easily accounted for. During eight months of the whole year the winds blow from between the points south-west and north-west, and consequently have to travel over the Atlantic Ocean. In their course over such an immense tract of water they become charged with moisture, which, on striking against the rugged hills of the west, they discharge in the shape of rain. The higher floating clouds that are carried on the westerly winds are attracted by Ben Wyvis and the other more elevated summits in the county, and are led away along the mountainous range into the wilds of Sutherland; and thus the moisture that comes with the westerly winds is spent among the hills on the west before reaching the lower levels of the east. Again, the winds that play right into the east coast have only a limited stretch of water to pass over, and thus they bring very little moisture with them. These easterly winds, however, blow over the coldest regions of Europe, and though they are much drier they are considerably colder than the westerly winds, which are raised in temperature by their passage across the Atlantic. The easterly winds are

invariably bitterly cold, and when they prevail in spring the young crops frequently sustain heavy damage by their blasting influence. It is the proverbial mildness of these westerly winds that accounts for the temperature on the west coast being higher during winter than on the east. In the districts of Balmacarra, Strone Ferry, and other parts on the south-western borders of the county, snow seldom if ever falls, and when it does it never lies for any length of time. Here it rains almost always, as may be seen from the fact that the rainfall at Loch Alsh in 1875 reached the enormous depth of 6 feet 9 inches.

In Easter Ross the climate is probably as favourable for agricultural purposes as in any of the more southern parts of the kingdom. The exposure in the main is southern, the soil chiefly a rich kindly loam with good subsoil, while its proximity to the genial waters of the ocean renders the atmosphere around it humid, mild, and equable. The climatic characteristics of Easter Ross and of the better parts of Morayshire are very similar, and seed-time and harvest usually begin and end about the same days in both districts. The soils, too, have many similarities, though there is probably not so much stiff unmanageable clay in Easter Ross as there is in the "Laich o' Moray." Harvest in Easter Ross usually begins about the second or third week of August, though of course exceptionally wet or dry seasons cause considerable variation in the exact date of commencement. On some of the earlier farms it began in 1876 about the 17th or 18th of August, and was completed about the 16th of September. Complaints were made towards the end of the eighteenth century that the climate of Ross and Cromarty was gradually becoming worse. About the advent of the present century it was argued that garden, fruit, and grain crops were well-nigh a fortnight later of ripening than some twenty or thirty years previous to that. In his admirable survey of the counties drawn up in 1808, Sir George Mackenzie records a statement he had heard that during the first half of the eighteenth century it was no uncommon thing for new meal to be exposed for sale at Contin Fair, which was held on the 1st of September, and adds—"If our corn looks ready for the sickle then we reckon ourselves very fortunate." He also says that about 1796 he had ripe peaches sent to his shooting quarters from the open wall in the month of August; while he adds—"I have not had them well ripened since till the middle of September, sometimes later, and often not at all." Whatever may have been the cause of that decline, or what its duration, we do not know; but there is not the least doubt that since the advent of the present century the climate at least of the east coast has improved very considerably. Originally the eastern districts of Ross and Cromarty were intersected with numerous small lochs and swampy bogs, but since Sir

George Mackenzie wrote his survey almost all these have been drained and brought under cultivation. The old land has also been drained over and over again, and this, combined with extensive planting, has made the climate of the east coast warmer, more equable, and drier than it had ever been before. It would be no uncommon thing now to have new meal ready for the market by the beginning of September, or even a little earlier than that; while in a moderately warm year open-air peaches might be had for the table about the end of August. Snow seldom lies to any great depth or for any length of time on the east coast; and it is only on rare occasions that the crops suffer any damage during the harvest operations. The whole of the harvest work is often finished about the third week of September, and thus a long, open autumn is available for the "ora" work of the farm. Ploughing is often commenced about the middle of September, and before the winter is fairly set in the whole of the stubble land, or at least the greater part of it, is invariably in the black furrow. Winter is an easy time with the Easter Ross farmers, and in an ordinary year there is less stir and bustle in spring than in most of the other counties in the north of Scotland. The land is usually in working order very early in spring, and with such a long autumn and such an open winter it is only what might be expected that the work of the farm is usually well advanced by the time the snowy months have passed away. The greater proportion of the wheat break is sown in autumn, and this of course also tends to lessen the work in spring. On the Cromarty lands, in the Black Isle, in the Contin district, and in Mid-Ross, which lie northwards, the climate is not quite so warm as in Easter Ross proper, and harvest is usually from a week to ten days later of being begun. The breadth of arable land on the west coast is very small, but on what does exist the harvest is generally about a fortnight later. The crops grow well in bulk, but the mean heat during summer being less than on the east coast they do not flower so satisfactorily as they do there, and are much slower in arriving at maturity. The heavy rains of the west also interfere very much with the drying of the grain after it has been reaped. The climate of the west coast does not suit wheat or barley, and consequently little but oats are grown in these parts, the earliest varieties of course being preferred. The soil on some parts of the west coast is found to be admirably adapted for barley, but the amount of sunshine usually enjoyed in these parts is much too little for this variety of grain. Snow falls heavily among the higher hills on the west coast, and when the wind happens to be high during a fall of snow the drifting is indeed terrific. Immense wreaths collect in the sheltered places, and occasionally considerable loss is sustained by flock owners by numbers of their sheep being smothered in these snowy accumulations.

The following table shows the rainfall at various points throughout the two counties in 1875 :—

WEST ROSS.		Rainfall in Inches.	No. of Days on which '01 or more fell.
Loch Alsh,		71·18	162
Strome Ferry,		55·01	117
Duncraig,		31·60	...
Applecross Gardens,		47·89	216
Strathconan,		46·44	228
Gairloch,		38·59	194
Loch Vraon,		51·95	...
Loch Broom,		56·70	...
Braemore,		53·70	...
Stornoway,		26·10	...
Lewis Castle,		45·19	238
Berneria, in Lewis,		48·90	...
Butt of Lewis,		33·77	206
EAST ROSS.			
Dingwall,		30·23	173
Cromarty,		16·89	...
Invergordon,		24·41	130
Fearn,		22·84	166
Ardross Castle,		35·24	203
Springfield, near Tain,		24·80	167
Tarbatness,		16·84	..

Geology—Soil.

A complete technical account of the geology of a county is not absolutely necessary in connection with a survey of its agriculture. So largely, however, is soil influenced and regulated by the rocks which underlie it that we shall offer a few sentences regarding these, avoiding technicalities as much as possible. Speaking generally, it may be said that all over the east coast, including the Black Isle, Mid Ross, and Easter Ross proper, the prevailing formation is what we may call Hugh Miller's Old Red Sandstone. That illustrious geologist was not only born amidst the Old Red in its most perfect form, but also learned in after years to make practical use of its blocks. It was around the little northern burgh which gave him birth that he made his first geological observations; and in the racy, fascinating sketches which he has given to the world of his painstaking researches, he has provided an account of the geology of the northern counties generally, and of Ross and Cromarty in particular, that will suffice for all time coming. While the Old Red is undoubtedly the prevailing formation on the east coast, it is greatly broken up and intersected in several districts by irregular blocks of granite-gneiss, quartz, hornblende, and other rocks of the primitive layers. Large unshapely masses of conglomerate occur here and there all over the east, diversifying the soil and lending an irregular rugged

appearance to the surface. The Old Red is probably found in the most perfect form in the Black Isle, which in fact consists mainly of a series of sandstone ridges intervened by extensive valleys covered with rich fertile soil. The ridges are composed of hard red sandstone, intermixed here and there with impure granite conglomerate. The two higher ridges were for many years (by some even yet) regarded as belonging to the New Red Sandstone formation, but important discoveries of fossils which Hugh Miller made at Cromarty have assigned for them an everlasting place among the ridges of the Old Red. At the eastern termination of these ridges, and to the north-east of the village of Avoch, a large granite ridge has been upheaved from below the sandstone formation, making the configuration of the neighbourhood extremely irregular. The sandstone formations stretch away into the lower parts of the parishes of Contin, Fodderty, and Dingwall, and is covered in some parts with a strong reddish clay. In the higher lying parts of these, and, in fact, in all the parishes running back into the hills, the prevailing formation is gneiss mixed with its subordinate rocks. In the neighbourhood of Strathpeffer there is a good deal of dark calcareo-bituminous schist, soft and foliated, and mixed with beds of shale and substance resembling coal, but which has been found to be a "slaggy mineral pitch." The parishes of Alness, Logie, and Kilmuir Easter rest almost entirely on sandstone, with here and there unshapely heights of granite conglomerate, gneiss, and coarse quartz rock. Ironstone also exists in considerable quantities among the gneiss rocks, and a sample dug from the Alness district was analysed and found to contain 75 per cent. of iron. In Urquhart and Logie Wester the Old Red abounds very largely; and here, as in several other parts of the counties, freestone is quarried extensively for building purposes, both at home and in neighbouring counties. On the higher lands of Nigg a good deal of granite, gneiss, and schistose limestone is mixed with the sandstone; and to Rosskeen, Tain, and Edderton similar remarks may be applied. In Fearn and Tarbat the sandstone strata are more complete, and the surface and soil more uniform than in most of the other parishes. Unfortunately very little limestone is found to exist among the rocks on the east coast, though it is very abundant on the west. One small vein only has been found. Starting at the Soutars of Cromarty, it runs through the district in the direction of Tarbat Point, and is visible among the precipitous sandstone rocks which bind in the Moray Firth at Geanies. This vein is very small, in some places not more than 10 or 12 inches thick, but, nevertheless (to appropriate a remark of the late lamented Mr Kenneth Murray of Geanies), it may be regarded as "the mother of the beautiful white clover that grows so richly in Easter Ross."

In Kincardine granite and whinstone abound, while with few exceptions the formation among the hills on the west is gneiss, mixed or alternating with mica schist, quartz rock, ironstone, and mountain limestone; the latter exists in great abundance, and is extensively used for agricultural purposes. The Old Red, however, is not altogether wanting even on the west, for at Applecross, Lochcarron, Gairloch, and Lochbroom considerable quantities of it are seen. Iron was at one time quarried in the Gairloch district; but the only fuel at hand was the natural wood, and when it became exhausted the work was abandoned.

True to the general characteristics of Old Red Sandstone districts, the surface of Ross and Cromarty is diversified and irregular. Around Tarbatness, for instance, where the strata are pretty complete and unbroken by trap upheavals, the surface is flat and bare, and the soil light and fertile; while in the Black Isle, in the parish of Nigg, and in other parts where there are marks of trap eruptions and heights of hard conglomerate, the surface is very irregular and uneven—in the words of Dr Page, “here rising in rounded heights, there sinking in easy undulations; now swelling in sunny slopes, and anon retiring in winding glens or rounded valley-basins of great beauty and fertility.” The soil which usually overlies the Old Red Sandstone is light loam, almost approaching clay, and invariably the subsoil is composed of sand, gravel, and friable clay, these in fact being the debris of the formation. Speaking generally, the soil of Ross and Cromarty corresponds closely to what might be looked for above their geological formation; but as it is not the underlying formation alone that regulates the soil, it is only natural to expect several deviations from the general rule. On the Black Isle the soil varies a good deal. On the centre ridge, on what was once Mulbine Common, the soil is very light and gravelly, and on many parts the underlying rocks come very close to the surface. Dry seasons do much damage here; in fact, in a very dry year, such as 1868, almost every well along the top of the isle becomes dry. In the basins between the ridges, and along the coast the whole way round, the prevailing soil is rich black loam and fine clay, lying on sand or gravel on the lower flats, and on firm clay on the slopes. A hard iron pan divides the soil from the subsoil in some parts, but where it could possibly be done this has been cured by substantial trench ploughing. A good deal of the land facing the Cromarty Firth lies on a bed of stiff reddish clay, reaching in some places as much as 100 feet in depth. On the land sloping south-west towards Dingwall and Conan, the soil is principally a light sandy loam on an open bottom, very fertile and easily cultivated. On the land around Dingwall, and between the town and Conan, there is a deep deposit of loam with a large admixture of clay, very suitable for the growth of wheat,

but demanding great care in the cultivation. If well manured, timely cultivated, and well seeded, it seldom fails to yield a good crop. The soil on the lower parts of the rising land in this district is clayey also, but the admixture of it being smaller, the land is more easily cultivated than on the level below, and is suitable for the growth of all kinds of crops. The higher cultivated land is mountain clay or moorish soil. The former becomes good soil with long continued good treatment, but the latter is very difficult to improve. In the Contin district the soil varies from strong clayed loam to light friable mould. In the valley of Strathpeffer, also, the soil varies a good deal. On the higher land on the north side of the valley the soil is excellent reddish loam, with a very little clay amongst it. On the low land on the same side the soil is mossy mould on a blue clay subsoil. On the high land on the south side the soil is a soft fibrous red clay, while on the low land on the same side the soil is composed chiefly of moss and gravel. The land on the farm of Fodderty in this valley affords a very striking illustration of what we hold to be a curious fact, viz., that, speaking generally for the northern counties of Scotland, the soil as a rule is heavier and richer on land with a northern and north-eastern exposure than on land lying to the south or south-west. Mr Arras, the enterprising tenant of Fodderty, finds that while turnips grow a much heavier crop on the north side than on the south, grain varies still more. On the north side barley yields $5\frac{1}{2}$ quarters per acre, and weighs about 56 lbs. per bushel; while on the south side the yield is seldom much over 4 quarters, and the weight usually about 54 lbs. Wheat and oats show almost a like difference, oats even a little more in weight. Between Dingwall and Alness the soil varies a good deal. Close to the Firth some of it is very rich loam, while on the heights a short distance inland light shingly loam prevails. On the Ardrross property around Alness, the soil varies from light black loam to heavy brown loam nearly 2 feet deep, lying on arenaceous clay. Between Alness and Invergordon, and throughout the parishes of Kilmuir, Easter and Logie Easter, the soil is mainly light, sharp loam, lying on clay or gravel, and here and there very close on the sandstone rock. While some patches are very light and shingly, on the other there are a good many fields of heavy rich black loam. The west end of the parish of Nigg is covered to the depth of nearly 2 feet with light drifting sand, which on being removed, is found to overlie a deposit of the very richest of black loam. Tradition tells us that previous to the 17th century, the west end of Nigg was one of the most fertile and best cultivated parts of Ross-shire, and that like Culbin, near Forres, and Morichmore, near Tain, the whole was buried by drifting sand in one single night. Loam predominates through the remainder of

the parish, but here and there strong clay takes its place. The soil on the bank land in some parts varies from 3 to 4 feet of the finest of alluvial loam lying on the red sandstone, and unless in exceptionally bad years, it never fails to yield excellent crops. The soil in the adjoining parish of Fearn is also of very fine quality and much of the same texture as in the better parts of Nigg. On the estate of Allan, and about the farm of Cullis, the soil is mainly strong adhesive clay, with a slight admixture on the rising parts of vegetable loam. In the parish of Tarbat the prevailing soil is light fertile loam, lying chiefly on the Old Red Sandstone, but some of it also on gravel and boulder clay. A good deal of inferior land lies in the parish of Tain, the soil being light and scarce, and resting on a firm impenetrable iron pan. What of the soil is good consists chiefly of mixed loam lying on clay. Throughout this parish, and in fact here and there over the whole of the arable land in both counties, numerous large water-worn granitic boulders are found embedded in the soil. These boulders belong to the primitive formations, and, like the many huge pieces of granite of similar shape that are occasionally found in the Lothians of Scotland, must have been carried thither from the hills by icebergs during the glacial period. Along the coast from Tain to Edderton the soil is very light, and lies mostly on a sandy bottom. About Invercarron and Bonar Bridge there are a few fields of very fine alluvial land, yielding rich returns of all kinds of crops. On the small pieces of arable land that do exist on the west coast, the soil is not heavy but wonderfully fertile. As already stated, the whole of the island of Lewis was originally covered with moss, and the greater portion of the flatter parts is still in the same condition, except on the sea coast and borders of sea lochs, where the crofts and farms are situated. In the course of centuries the moss close to the inhabited parts of Lewis has been cut away for fuel, and now there are considerable tracts on both sides of the island cleared of it. It is on the gravelly, strong subsoil thus laid bare that agriculture is chiefly carried on, the exceptions being where pieces of moss or sand near the sea-shore are wrought for crops.

The Farming and Social Customs of Older Times.

All things are judged by comparison, and therefore before proceeding to detail the farming of Ross and Cromarty, as now carried on, it might not be out of place to devote a few pages to the systems of agriculture that prevailed from fifty to a hundred years ago. The ancient agriculture of Ross and Cromarty is fully described in Sir John Sinclair's "Statistical Account of Scotland," and in "A Survey of Ross-shire," drawn up for the Board of Agriculture by Sir George Stewart Mackenzie, Bart.,

about the year 1808, and published in 1810. Much, however, as is given in these admirable volumes, we are able to supplement them with a few original notes on the "golden past." We have been favoured with an old interesting manuscript, written at various times during his life, by the late Mr John Wallace, who died two years ago at the advanced age of ninety-three years, and who was for a very long time an extensive farmer in the parish of Rosskeen. We subjoin the following extracts from this manuscript:—

Farming Customs.

"My father, John Wallace, had the farms of Culrane and Gushack for thirteen years, from 1779 to 1792, at a rent of 140 bolls, part barley and part meal; and duties of money, peats, and hens. At that time he had no 'coup' (box)-carts, and neither mattock nor spade. For driving the manure to the land he had a kind of cart and a basket of wicker-work. The wheels of the cart were constructed of three sticks, six inches in diameter, which were crossed and fixed in the centre by an axle that turned with the wheels on 'tum'lers,' as they were called. Stones as well as manure were conveyed in these carts, and they would carry a heavy load. The wicker-basket cost one shilling, and would last for two years. For carrying home peats, and leading corn, he made a very simple cart of two long shafts, with cross sticks in the bottom, and standing rungs with top rails. As soon as the crop was put in, these carts were taken off the 'tum'lers' and put into some shed until the peats should be ready for carrying home, when they were used again. All the carriage of corn, meal, and potatoes was done in bags on horseback. Going to the mill, seven or eight horse would be tied in a row, the one to the other's tail, with halters made of horse-hair. A boy led the first horse, while two men were employed in keeping the bags from falling. My father had three ploughs, and six oxen to each plough. The ploughs were made by himself almost entirely of wood, all the iron used being a strong culter, a sock, and a large hook fixed at the point of the beam, with a 'stepple' and a few nails, which were required to fix the clading (or mould-board) of deals. When the oxen were strong, the ploughs would work as well as any made for many years after, and would turn over a deeper furrow. The harrows were made of birch, with five rungs across through the 'bills.' He had no grapes, only two large forks; and in place of a mattock, he had a croman or half-mattock, like a pluck for turnips, but much larger. For a spade, he had a large wooden shovel, mounted with iron at the point and up both sides. The dung was allowed to lie in the byres for a week, and then it was carried to the 'midden' on a wheelbarrow, or sometimes on a two-handed barrow, such as used by

masons. Women took part in all the farm work, except ploughing, thrashing, and carrying bags. Neither clover nor turnips were grown, but there would be about sixteen bolls of potatoes. The work in summer, after sowing the barley, about the 20th of May, was first to cut peats, and then to make 'middens' for next year's barley. These 'middens' were made of soil cut from the outlying land, mixed with the manure of horses and cattle. Horses or cattle got very little corn; but when any of the cattle were weak about end of spring or beginning of summer, they got sheaves of oats in the morning. At that time there were very few large farms. On the farm of Milleraig [Mr Wallace himself occupied Milleraig and Nonekilm for many years up till 1851] about 1760 there were eight tenants and ten ploughs, with sixty animals; now three ploughs are sufficient. On the farm of Nonekilm I saw seven tenants and nine ploughs; three ploughs are now sufficient. On Rosebank I saw three tenants and four ploughs; two ploughs are now sufficient. In my young days the large farm of Newmore was occupied by Mr Alexander Ross or McFindlay and his two sons, the rent being L.80 and 80 bolls of grain. He and his sons were altogether of the old school. He had eight horses carrying home his peats, the carts used being the 'rung carts' with the 'tum'lers.' There was not so much as a pin of iron about the harness of the eight horses. For shoulder-chains and 'hems,' birch wands were used instead of iron. I remember well to have seen a pair of horses passing Nonekilm with furniture from Strathcarron to Inverness, and to have observed that there was not a single link or pin of iron about the horses or the cart. The traces (the draught chains) were made of deerskin, and were very tough and strong. The collars used on horses at that time were made of ropes of straw twined threefold. These would last about a year; but when made of loch rushes, four feet in length, they would last two years. The farmers made the harness themselves. In short, they made everything. There was no need for saddlers, but weavers were numerous, and they got plenty of work to do. There was only one merchant in the parish of Rosskeen, and it was from him my father bought his first spade. I wondered much at it, as it was the first spade I had ever seen."

Servants' Wages.

"Married men for the twelve months got L.4, six bolls of meal, two days to cut peats, straw for a stirk, land for potatoes for their own manure, land for sowing two pints of linseed, and a small garden. Women in the half-year got ten shillings, a pair of shoes, and land for linseed. Shearers got eighteen pecks of oatmeal by measure."

Diets of Servants.

“At breakfast, ‘brochan’ and peasemeal bread; at dinner in summer, whey and bread; and in winter, potatoes and bread; at supper, sowens or ‘brochan.’ There was cabbage for dinner once a-week; and next day porridge, made of what remained of the cabbage, was taken with butter at breakfast. My father always fed a cow, to be killed in winter; and as long as it lasted, the servants got broth, and sometimes beef. During winter and spring there was always plenty of home-made ale; and the servants occasionally got ale, butter, and curds; but porridge was seldom seen. The servants got three feasts in the year, the one on Old New Year’s-day, another when the barley was sown, and another when the shearing was finished.”

Clothing and Social Customs.

“The clothing was very simple and plain. The men wore black knee-breeches and bright blue coats, made by their wives. The young men generally wore similar attire, but some had kilts. Even the larger farmers wore broad blue bonnets, and no hats were to be seen. About 1792 some favourite sons began to get trousers, and by 1850 breeches had almost disappeared. In my father’s time no farmers’ wives had prints or cotton gowns. Their gowns were of their own making, chiefly wincey. The wives wore a small tartan shoulder-plaid, and it was considered to be decent and matron-like for a farmer’s wife to have a clean white towel tied on her head above the ‘mutch’ or cap. No young ladies covered their head until married. Their hair was their pride. It was all combed down their shoulders, and when at work was tied at their back with tape. At the marriage ceremony the bride was always covered with a scarlet plaid; and if she had not one of her own, she got the loan of one. The gatherings at marriages were usually very large, and there was music and dancing on four nights; on Thursday night, at the feet washing; on Friday night, after the marriage; on Saturday evening and part of the day; and again on Tuesday, at what was called the ‘home wedding.’”

Memorable Years.

Under this heading Mr Wallace has a number of very interesting notes on great events of national as well as local importance. Referring to the remarkably wet year of 1782, which was called the “Black Year,” he says, “there was scarcely a dry day during the whole spring, while summer and autumn were also very wet. The crop was late and miserably poor, in fact the greater portion of it never ripened at all. Mr Calder, the minister of Rosskeen, was paid in grain, and all he got that year was

16 bolls of barley from my father, and those 16 bolls scarcely made 8 bolls of meal. Many cattle died in the spring, but none of the inhabitants succumbed to the hardships of the famine. I was told, however, that many deaths would have occurred had it not been that cargoes of white pease (which had been intended for the troops engaged in the American war, but which on the announcement of peace were sent northwards) came to Ross-shire, and the pease distributed among the more needful. My father was present at the distribution. The following year was as singularly dry as 1782 was exceptionally wet. The crop was very early, some of it having been stored by the end of August; but, owing to the inferior quality of much of the seed of the crop of 1782, the general yield was very poor. Many farmers fell in arrears, and some of them never got over it." The year 1792 was quite as remarkable in Ross-shire, though from a different cause. A few years before this sheep-farming was begun in the county of Ross, and the natives believing that this innovation would compromise their comforts and privileges, began about this year to display formidable opposition to the movement. Mr Wallace says:—"The native farmers, tradesmen, and labourers, resolved to gather the whole stock of sheep in Sutherland and Ross and drive them over the southern borders into Inverness-shire. Accordingly, the arrangements for the outrage against sheep farmers were made known by proclamation at the church doors. A mob of people met, and having collected above 10,000 sheep, they were proceeding with their flock along the heights of the parish of Alness, when they learned that Colonel Sir Hector Munro of Novar was on his way from Fort George with a company of the 42d Highlanders to suppress their depredations. The sheep gatherers dispersed immediately, but a good many were apprehended and tried in the Circuit Court at Inverness. Two were transported, but the others got off with imprisonment. The commencement of this affair was as follows:—Captain Allan Cameron and his brother Alexander Cameron took the farms of Tyrish and Culcraigie, along with the extensive grazing of Gildermorry on the heights of Alness. The cattle of the Ardross tenants had previously been grazed all summer on Gildermorry, and having wandered back to their old pastures, the Camerons pointed them, and enclosed them in a large fank which they had built for the purpose. That day the Ardross tenants were hearty at a wedding at Strathriesdale, but on hearing what had happened to their cattle they proceeded in a body to Gildermorry, where an ugly fight took place between them and the Camerons. And thus the feeling against the introduction of sheep-farming waxed into wrath and displayed itself as already noticed." The year 1800 seems to have been a very dry year, scarcely a single drop of rain having fallen during the

whole summer. Mr Wallace says:—"The crop was not half an average one in bulk, but so far as it went it was good. Barley brought 50s., oatmeal 48s., and potatoes 40s. per boll." The year 1811 was very wet, and the greater portion of the crop dreadfully damaged. Mr Wallace got 54s. per boll for his barley that year. The crops of 1816 and 1817 were also bad, oatmeal being about 40s. per boll, while in 1836 Mr Wallace's whole crop would scarcely pay his rent.

Mr Wallace's notes give a pretty good idea of how farming was carried on, and how people lived throughout the counties generally, about a hundred years ago, and now we shall add a few sentences regarding the state of matters during the first fifty years of the present century. Previous to the advent of the present century no regular system of rotation seems to have been observed, while not a single turnip, and only a very little wheat, were grown. Barley, oats, and potatoes were almost the only crops cultivated. The acreage under grain was small, and even on the larger farms there were only three stacks,—one for the laird, one for seed and sale, and one for family use; the barn being filled first of all. In these days there were no direct roads through the counties, and no convenient means of getting grain or anything else exported to distant markets. The implements in common use on the farms and crofts were very little, if any, improved till well into the present century, while the ancient and unprofitable system of over-stocking farms with cattle and horses was totally abolished only some forty or fifty years ago. Sir George S. Mackenzie states that he has frequently seen on a Highland farm two working animals for each acre, and gives the following interesting particulars regarding one notable case:—"Thirty acres were occupied by two men, who had large families. They possessed the land not in run-rig, but in common. Both exerted themselves in cultivating the fields, and they agreed respecting a particular but very irregular rotation of crops, and divided the produce equally between them. They paid about fifteen shillings per acre. On this farm were kept ten horses and six head of cattle, besides young beasts. The land was remarkably full of weeds of all sorts. After the cattle had done ploughing they were turned upon the field on which they had been working, in order that they might feed upon the weeds which had been turned up. I never observed that they got any sort of food during the day, except a small quantity of oats just before they went to work. At night the horses and cattle were turned to some patches of waste ground to pick up a miserable pittance of grass. During the summer months the animals were sent to graze on some bare hills; the horses being brought down when the peats were ready for storing, and sent back as soon as the fuel was got home. When the corn was ready to be taken

from the fields the whole stock was brought home and allowed to range on the stubbles. No grass seeds were ever sown; the whole farm was under wretched crops of oats and barley. Three or four, and not unfrequently five crops of oats followed each other in succession; and when barley was sown with manure three or four crops of oats followed. No greater quantity of potatoes was planted but what was barely sufficient to answer the home demand. During the winter the horses and cattle were fed on straw, but sparingly. The straw was always very short, and from the system of management just described it will readily be believed that the quantity was not very great, and hardly enough to keep six black cattle and ten horses alive during seven months of the year." The cattle reared in those days were West Highlanders of an inferior class, and the niggardly way in which (over the whole north) they were usually fed during winter was simply shameful. About a hundred years ago, in fact, the provender available for cattle during winter was so very limited in quantity and inferior in quality that it was regarded as no mean achievement for farmers to be able to feed their cattle during the snowy months, so that when spring came they might have sufficient physical firmness left to enable them to walk to the hill grazings without first undergoing special treatment for the journey! As mentioned by Mr Wallace, those animals that were so weak as to be unable to walk to the hills were fed for a week or two on sheaves of oats. Feeding, as the term is now understood, was unknown then. We were told an anecdote the other day of an English lady having come to take up her residence in Easter Ross about the beginning of the present century, and having got so awfully horrified at discovering that the only kind of beef to be had in the county was that of old cows, that she immediately repacked her "goods and chattels," and betook herself to the more genial south, where she might feast on the "roast beef of Old England."

The ancient farm horses of Ross and Cromarty were the broad low-set "garrons," while the native sheep was of the Kerry breed, little, and very slow in growth. About the year 1764, Sir John Lockhart Ross of Balnagown began to turn his attention to sheep-farming, took one of his sheep-farms on his estate into his own hands and stocked it with Blackfaced sheep, which he purchased at Linton market. Strong opposition was shown to Sir John in this scheme, but though he suffered heavy losses at the outset he persevered, and by the lessons he taught and the encouragement he held out to others, that extensive system of sheep farming which has made Ross-shire so famous was fairly inaugurated. The rise and progress of the movement deserves more than a mere passing notice, but that had better be done while treating of sheep-farming as a special subject.

During the first fifty years of the present century it is not too much to say that the agricultural and social customs of Ross and Cromarty were completely revolutionised. Large tracts of land were reclaimed, draining and fencing were executed extensively, new dwelling-houses and farm-steadings were built, roads were made, improved farm implements were introduced, threshing-mills brought into the country, a regular and systematic course of cropping was adopted, artificial manures introduced; the barley, oats, and potatoes of the olden times supplemented by wheat, turnips, and clover; better horses, better cattle, and better sheep were bred; and, in short, almost every trace of the primitive simplicity and rude barbarities of the feudalistic times were abolished for ever. We cannot, of course, go into detail on these gigantic changes, but we may transcribe from the report on the parish of Tarbat in Sir John Sinclair's "Statistical Account of Scotland" the following remarks regarding the introduction of modern husbandry into Ross-shire:—"In the year 1798 the farm of Meikle Tarrel in the parish was taken on a nineteen years' lease by a farmer [Mr George Mackenzie] who had studied the most approved mode of agriculture in East Lothian. The farm, which then consisted of about 250 acres of arable land, was occupied by several small tenants, whose lands were in a state of wretchedness, and their house afforded accommodation for neither man nor beast. This farmer brought with him horses and implements of husbandry of the very best description from the south, as also farm servants of his own training. This was the first introduction of modern husbandry into this part of the country, from which the introducer obtained the name of Farmer George. In bringing his system into practice he had at first to contend with many deep-rooted prejudices. Even the proprietor could not then understand how his interests were to be forwarded by encouraging his tenants. In the first place, a dwelling-house was to be built, as also a set of suitable offices, houses, and a thrashing-mill and garden, &c., enclosed. All this was done at the farmer's own expense, without any assistance from the proprietor, and at an outlay of L.1500. The soil being good, and the new system bringing it into favourable operation, the farmer soon began to reap the reward of his expense and labours, and in the seventh year after his entry he had the satisfaction of obtaining for his wheat and oats the highest price in Mark Lane—circumstances which dissipated the opposition of prejudice, and raised up a spirit of imitation." Almost simultaneously with Mr Mackenzie, Mr George Middleton came north from England, and began farming in the parish of Cromarty. Mr Middleton, whose grandsons now farm so extensively in Ross-shire, erected the first thrashing-mill used in this part of the country, and exported the first wheat. Among the others who took part in the early

improvement of the agriculture of Ross and Cromarty may be mentioned Mr Mackenzie of Allan Grange, Captain Munro of Teanich, Mr Rose of Glastulich, Mr Cockburn Ross of Shandwick, Mr Mackenzie of Hilton, Sir Hector Munro of Novar, Mr Macleod of Geanies, Lord Seaforth, Major F. Mackenzie of Fodderty, Mr Mackay of Rockfield, Mr Reid of Kinnairdy, the Rev. Mr Mackenzie of Fodderty, Mr Archibald Dudgeon (a native of East Lothian), and Captain Rose of Bindhill.

Progress of the Past Twenty-five Years.

Probably the second twenty-five years of the present century saw quite as much improvement effected in the counties of Ross and Cromarty as the past twenty years have seen—much, indeed, as that has been. As already hinted, the spirit of improvement began to dawn about the advent of the nineteenth century, and by the end of the first quarter a wonderful amount had been accomplished; in fact, by 1825, the better favoured parts of the counties could boast of agriculture of the highest description. A faint idea will be had of what condition some of the better farms were in about that time, when it is mentioned that at a sale which the late Mr Dudgeon had at his farm of Arbol in 1824, he obtained L.84 for an entire horse, L.52, 10s. for a son of that horse, L.52, 10s. for a saddle mare, L.25 for a Highland fat cow, L.50 for one Highland bull, and L.40 for another; while he refused L.100 for a riding pony, and L.75 for a six-year-old ox that had been feeding for three years. Wheat was unknown at the beginning of the century, and by 1825, or thereby, it had become the staple product of several districts. Advanced, however, as the agriculture was in these times on a few of the finer farms, there was still much room for improvement throughout the counties generally, and it was during the next twenty-five or thirty years that the rougher and probably the larger part of that much-needed improvement was effected. While in its virgin state the land, or at least the main portion of it, was wet and swampy, and before it could be cultivated with profit it had to be thoroughly drained, and many hundreds of acres of it trenched at a cost per acre of from L.10 to L.20, and in some cases even L.25; and, in addition to all this, a complete new set of houses had to be built, roads had to be made, fences erected, and other odds and ends carried out, so that the cost of early improvements in Ross and Cromarty was indeed very high. The landlords and tenants, however, were fully aware of the natural richness of their country, and undaunted by the immense outlay, they laboured on industriously until they had accomplished their end—the raising of Ross and Cromarty to a prominent position among the best cultivated counties in the kingdom. Some of them may have lost money by their laudable exertions; but if such was the case,

they at least had the satisfaction of leaving their beautiful country better than they found it. Those who commenced farming, or obtained the possession of land about 1850, found the counties in a very different state from that in which they were discovered by Mr George Mackenzie and Mr George Middleton when they settled at Tarbat and Cromarty respectively, exactly fifty years prior to that. But even at 1850 all that was desired had not been effected. There was still a corner of the web to weave, and how thoroughly that work has been accomplished we hope, further on, to be able to show.

Details of the reclamations and other improvements of recent years will be given afterwards; and here a general *resumé* only shall be offered. The agricultural returns when first taken up in 1854 were rather incomplete, and in Ross and Cromarty, as in several other Highland counties, all holdings rented under L.20 were excluded from the returns. Correct comparison with twenty-five or thirty years ago is therefore not very easily obtained. It has been calculated that about twenty years ago there were close on 6000 tenants in Ross and Cromarty paying under L.20 of rent, and that their arable areas averaged about 3 acres, which would give an area of 18,000 acres of arable land not included in the Agricultural Returns. This may be accepted as pretty nearly correct, and accordingly the arable area in Ross and Cromarty in 1854, on holdings paying L.20 and upwards of annual rent, was 69,919 acres, and on small holdings 18,000—total, 87,919 acres. Compared with the present day the figures stand thus—

Arable area in 1854,	. . .	87,919
" " 1876,	. . .	124,826
Increase in 22 years,	. . .	36,807

Taking it for granted that the three years immediately preceding 1854 were as industrious in the march of improvement as an average of those years that have since elapsed, we may safely put down the number of acres reclaimed since 1850 at 41,830. This we believe to be a much greater breadth of land than that brought under cultivation in any other county in Scotland in a quarter of a century; and in addition to the reclamation of these many thousands of acres, and all the other improvements necessary for the proper cultivation of the new land, a very great deal has been done since 1850 in the draining, squaring up, and fencing of old land. In fact, it may safely be said that during the past twenty-five years every acre of arable land that did not happen to be naturally dry enough for cultivation has been thoroughly re-drained, some of it even twice over. For some years back great attention has been paid to fencing, and almost every arable farm is now tolerably well provided with fences. Wire fences predominate, but stone dykes and hedging also exist extensively.

In the long run hedges probably form the best fence, and also afford the most shelter, but they are slow in growth and troublesome to keep. Dykes are substantial, but expensive; and on the whole it is easy to suppose that wire would gain the most favour. It is cheap, easily moved about, and can be erected in a marvelously short space of time. Of course, the large addition that has been made to the arable land during the past twenty-five years has necessitated the erection of a good many complete new sets of farm-houses; and, in addition to these, great improvement has of late been effected on the buildings on the old land.

The systems of cultivation have also improved very much, while better crops of all kinds are now grown. The supply of farm-yard manure has increased, taking value and bulk together, nearly thirty fold during the past twenty-five or thirty years, while probably ten times as much artificial manure is used now as there was even fifteen or twenty years ago. When these valuable stimulants were first brought into this country a great deal of talk and discussion was occasioned by the high-sounding reports which were circulated as to their wonderful fertilising powers. Guano was used extensively in several counties north of the Tay before it reached Ross and Cromarty; and it was no uncommon thing to hear those farmers who invested in it talked of as extravagant, venturesome men. About the year 1844 the late Mr George Middleton, Fearn (one of the ablest and most enterprising tenants Ross-shire could ever boast of), and Mr Sim, Scotsburn, better known in later times as of Drummond, agreed quietly together to invest in a ton of guano, keeping their speculation in the dark lest they should be made sport of for their adventurous conduct. The guano did its work most admirably, and greatly astonished all who witnessed its wonderful effects. Small quantities of bones had been used previous to 1844, but it was the grand success of this quiet unostentatious experiment that gave artificial manure the first decided hold in Ross-shire. The quantity of these fertilisers that is now used in Ross and Cromarty every year is almost incredible. The percentage of the arable land under turnips and potatoes is a little over sixteen, and while very few give less than 4 cwt. to every acre under green crop a good many exceed 7 cwt. The average all over would probably be about $5\frac{1}{2}$ cwt. And beyond all this, a good many farmers speculate heavily in top-dressing, some of them going even the length of an outlay of from L.1 to L.1, 5s. for every acre on the farm, apart from green crop land, for top-dressing alone.

During the first fifty years of the present century the ancient primitive-looking implements of the farm gave way gradually to a new and more improved set; and now we find in Ross and Cromarty the most modern agricultural implements of all kinds.

The introduction of these improved implements has not only economised labour, but has secured better cultivation ; while the native labourers themselves—an industrious, quiet, contented lot of people—have in return for their greatly ameliorated condition learned to execute their work with better taste and more care than when driving the “rung” carts or “tum’lers,” and fed on “sowens” or “brochan.” Steam power also came to the aid of the labourers some four or five years ago ; and now it is employed extensively in farm work. Through roads have been of a high class for many years, but since 1850 a great deal has been done in the way of constructing and improving local or service roads.

Probably the last twenty-five years have done more in the improvement of the live stock of the farm than of any other branch of agriculture. By the introduction of superior sires the general standard of farm horses has been raised very considerably, while among cattle the improvement has been still greater. In a word, it may be said that Ross and Cromarty are not breeding but feeding counties. Eighty or a hundred years ago a great many black cattle of a very inferior stamp were reared in both counties, and sent away into more southern parts to be fed. Even yet on the smaller farms and lighter land a few cattle are bred ; but throughout the counties generally, feeding is the order of the day. The extension of the Highland Railway into the counties gave a great impetus to cattle-feeding, and since then this important branch of farming has been one of the leading features of their agriculture. It is certainly within the mark to say that for every bullock fed some forty or fifty years ago, ten are now prepared for the beef market. On two of the largest farms in Easter Ross in 1837 only from 5 to 10 acres of swedes were sown, and even those small plots were considered symptoms of extravagance. Now about three-fourths of the turnip break on the better farms of both counties are sown with swedes, while a few go even the length of four-fifths. And while the number of cattle fed every year has increased tenfold within the past forty or fifty years, that of sheep has increased an hundredfold. These are high-sounding statements, but nevertheless they are correct. A great many pigs are also kept on most farms, and on some upwards of 100 are fed off every year.

The extent and character of the agricultural improvements of recent years having been briefly indicated, it will now be interesting to turn to the Valuation Roll, from which we are able to give a few interesting and thoroughly reliable statistics. The following table shows the total valuation of both counties (exclusive of railways and royal burghs) at various periods since 1674 :—

	Ross and Cromarty.	Ross alone.
1674,	L.7683	L.6,609
1815,	121,557	...
1850,	160,565	153,165
1855-6,	170,395	162,565
1857-8,	179,745	171,800
1862-3,	194,475	186,321
1866-7,	210,991	202,320
1870-1,	237,003	227,699
1875-6,	260,166	250,305
1876-7,	262,817	252,908
Increase over both counties since 1674,		L.255,134
Do since 1850,		102,252
Increase in Ross alone since 1674,		246,299
Do. since 1850,		99,743

Such an immense increase as L.102,252 during the short period of twenty-five years must be regarded as very satisfactory indeed, and as reflecting the highest credit on the landed proprietors and tenant-farmers of both counties. In fact, as we shall endeavour to show presently, the counties of Ross and Cromarty have put almost all the other counties in Scotland into the shade with respect to increase of valuation. The following table shows the position Ross and Cromarty occupy, in comparison with the fifteen Scotch counties (excluding Lanark and Edinburgh, the agricultural value of which is greatly intermixed with other interests) that exceeded their total valuation in 1815:—

	Acreage.	Rental in 1815.	Rental in 1875-76.	Increase.
Inverness,	2,723,501	L.185,565	L.293,250	L.117,685
Argyll,	2,083,126	227,493	458,984	231,491
Ross and Cromarty,	2,016,375	121,557	260,164	138,607
Perth,	1,664,690	555,532	855,928	300,396
Aberdeen,	1,160,625	325,218	778,612	453,394
Dumfries,	705,946	295,621	460,221	164,600
Ayr,	735,260	409,683	910,235	500,252
Kirkcudbright,	610,343	213,308	346,503	133,191
Forfar,	569,840	361,241	554,762	193,521
Roxburgh,	428,494	254,180	420,161	165,980
Fife,	328,427	405,770	686,338	280,568
Wigtown,	326,736	143,425	222,866	79,441
Berwick,	309,375	245,379	380,093	134,714
Stirling,	295,875	218,761	370,023	151,262
Haddington,	185,937	251,126	300,939	49,813
Renfrew,	150,000	265,534	523,861	258,327

It will thus be seen, that while in 1815 Ross and Cromarty were behind all these fifteen counties in valuation, they have now surpassed Wigtown by more than L.37,000. And what is a much greater feat, they have outstripped the whole of the fifteen excepting Aberdeen and Ayr, in the ratio at which the valuation has increased during the past sixty years. During that period

four (counting Ross and Cromarty as one) of the sixteen counties included in the above statement, have more than doubled their annual valuation—Aberdeen coming first, Ayr second, Ross and Cromarty third, and Argyll fourth.

As a rule, as will be seen from the table already given, the increase in the valuation of Ross and Cromarty has been gradual; and the subjects contributing most to this increase in their order are arable farms, grazing farms, shootings and deer forests, houses, crofts, fishings, harbours, &c. Prior to 1855 (the first year of the Valuation Act) no correct rental of these counties existed; and any statistics for earlier years are taken from the income-tax abstracts, made up by the surveyors of taxes, which, though correct as regards land, shootings, fishings, &c., are scarcely reliable as to house property. The following table, however, will show the gross increase in both counties from the various sources since 1850, as correctly as can possibly be ascertained, burghs included:—

	1850-51.		1874-75.		Increase.	
	Ross.	Cromarty.	Ross.	Cromarty.	Ross.	Cromarty.
Land, . . .	L.125,600	L.6,310	L.181,838	L.9,132	L.56,283	L.2,822
Houses not occupied with lands,)	10,824?	1,000?	37,095	2,272	2,671	1272
Fishings, . .	1,570	167	6,011	380	4,441	213
Harbours & Ferries, . . }	1,612	6	2,020	44	417	38
Shootings and Deer Forests, . . }	6,640	...	34,059	50	27,419	50
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	L.146,246	L.7,483	L.261,032	L.11,878	L.114,786	L.4,395

From this table it will be seen that, of the estimated increase of L.114,786 of rental in the county of Ross, the contributions from the various subjects are as follows:—

Land, . . .	48 per cent.	|	Houses, . . .	23 per cent.
Shootings, . .	24 „	|	Fishings, . . .	3 „
			Other subjects,	2 per cent.

The percentage of increase on each of the individual subjects in the county of Ross would be—

Shootings, . .	413 per cent.	|	Land, . . .	44 per cent.
Fishings, . .	282 „	|	Harbours, . . .	25 „

In order to give some idea of the increase since 1855 (the first year of really reliable statistics) in the valuation of arable farms, grazing farms, and crofts respectively, we shall select the following specimen parishes:—

	1855.	1877.	Increase per cent.
Fearn (wholly arable) rental, L.5853 17 0	L.9122 15 0		51·22
Tarbat, „ . 3915 3 0	6842 2 0		74·76
Nigg (some grazings), „ . 4933 0 0	6368 0 0		29·08

Average increase per cent. for three arable parishes, 51·22.

The greatest percentage of increase in these parishes is on the Balnagown estate, in the parish of Fearn, on which the increase since 1855 is no less than 109·40 per cent. The least is on the estate of Shandwick, in Nigg, on which the increase is only 9 per cent. As regards large grazing farms, we shall take the parish of—

	1855.	1876.	Increase per cent.
Glenshiel,	L.3040	L.4080	34·00

Regarding crofts, we shall select the parish of—

	1855.	1876.	Increase per cent.
Barras in Lewis,	L.2185	L.2788	27·00

These figures speak so plainly that comment is unnecessary.

The *gross* and *acreage* rentals of a county are two very different things. An increase in the former, during a certain period, can be ascertained to within a fraction; but of an advance on the latter only an approximate idea can be given. The immense increase that has taken place during the past twenty-five years in the gross rental of the counties of Ross and Cromarty is due chiefly to the increased arable acreage, and the growing demand for shootings and fishings; but still the advance has been swelled considerably by an increase on the acreage rental. That increase varies in different parts of the counties. On the arable land in some parts of the counties, the increase has been as much as 50 per cent.—in a few cases even more; in others, not more than 20 per cent.; but taking the counties as a whole, it may be stated with safety at from 25 to 35 per cent. The increase in the rental of grazing farms varies greatly. In a few cases it has been doubled since 1850; but of the majority of farms, the parish of Glenshiel, already quoted, may be taken as a fair specimen. A very pertinent question here would be, Have the altered circumstances of the agriculture of Ross and Cromarty, since 1850, warranted this large increase in the acreage rental? Speaking broadly, we are inclined to answer in the affirmative. A great deal more capital is required to farm a holding of, say 150 acres, now than in 1850; that is to say, the amount of grain, beef, &c., which that 150-acre farm is capable of producing, or rearing, for the market in a year, costs the tenant more now than twenty-five years ago. But, on the other hand, the advance in the revenue from a year's yield of grain, beef, &c., is even more than commensurate to the increased cost of produce. In other

words, on a 150-acre farm, the balance between what it costs the tenant to produce a full crop of grain, beef, mutton, &c., and what he receives for that crop, is larger in proportion now than in 1850. This is due, partly to the increased price that a quarter of grain and a pound of beef command in the market now, as compared with twenty-five years ago; and partly also to the fact that the improved system of husbandry pursued at the present day enables a farmer to bring more grain, beef, &c., out of an acre of land than it was possible for him to have done, by the appliances at his command, previous to 1850. And it is by the swelling or lessening of this balance that rent must really be regulated. The popular mode of book-keeping among farmers (of which, even as it is, there is too little), by which rent is placed in the costs' column, is against all principles of true political economy. The first duty of an intending offerer for a farm, is to calculate what it would cost him to produce on that farm a full crop of grain, beef, &c, including his own living, and what that crop would bring back in the shape of money; and then regulate the rent he could afford to the landlord for the use of the land, according to the balance between these two sums. In a few cases, this balance between the cost price and the selling price of the product of the farm is too small to warrant the rent now exacted. Speaking for the country generally, the extraordinary increase in the labour bill during the past few years has completely upset the whole calculations of many a shrewd, thoroughly practical farmer, who may have happened to enter on a farm, or a new lease, ten or fifteen years ago; and indeed it need be no matter for surprise that in the counties of Ross and Cromarty, as in every other county in Scotland, there are a few farmers who pay a higher rent for their land than it is really worth. But on the whole, we are decidedly of opinion that more money is being made off farming in Ross and Cromarty now than some twenty or thirty years ago; and that, taking the counties as a whole, the farming community is living more comfortably, and more respectably, than during any former period of our history.

It has been remarked that more capital is required to farm an acre of land now than some twenty-five years ago. The percentage of this increase is not very easily ascertained, but there can be no doubt that it is above 200. Thirty or forty years ago, it was quite common to hear of a farm being stocked and carried on with about L.3 per acre; in fact, about twenty-five years ago, a farm of 150 acres, in Easter Ross, was taken on lease by a tenant with a purse of L.200, and all along he has been doing very well. The sum required to the acre now, of course, depends very much upon the nature of the soil, and the class of stock intended to be kept; but, generally speaking, about L.12 per

acre is quite sufficient capital for any ordinary farm in this part of the country. The farm of Fearn, extending to 510 acres, is at present to let, and it is the general opinion of the farmers in the neighbourhood, that the purse of the incoming tenant would require, at the very least, to be equal to about L.8000. To stock and carry on a farm, however, of, say from 100 to 150 acres of ordinary land, from L.8 to L.9 per acre would be quite sufficient.

Details of Reclamations and of different Systems of Farming.

The many and extensive agricultural improvements that have been effected in Ross and Cromarty during the past twenty-five years, deserve more than a mere general notice, and therefore we shall add a few notes, which we collected on a recent tour through both counties. And while going into detail, we shall also indicate, as briefly as possible, the various systems of farming pursued in the different districts. For convenience, the immense tract of land to go over had better be divided into the following districts: first, the Black Isle; second, Mid Ross; third, Easter Ross; fourth, Wester Ross; and fifth, the Lewis.

The Black Isle.

This extensive tract of land is embosomed in two curiously bent arms of the sea, the Moray Firth and Beaully Firth on the one side, and Cromarty Firth on the other. The soil throughout the peninsula, as already stated, varies a good deal, but still it contains a large breadth of very fine land. Crossing from Inverness at Kessoek ferry, we enter the parish of Knockbain, in which there are several very fine farms. The largest proprietors in the district are—Mr J. F. Mackenzie of Allangrange; Mr C. Mackenzie of Kilcoy; the Right Hon. Henry J. Baillie of Redcastle; and Mr E. Maclean of Drynie.

The Allangrange estates extend to 3074½ acres, of which 2102 are arable; 547½ are pasture and waste land, and 425 under wood. The present rent is L.1891, 18s., and in 1850 it was L.1317, 10s. 8d.; increase during the past twenty-five years, L.574, 7s. 4d. The soil varies a good deal, and consists of peat, clay, sand, loam, and gravel, with here and there a pretty strong pan. The farms on the estate vary from 40 to 230 arable acres, while there are a large number of crofts ranging from 2 to 30 acres in extent. Since 1850 eight farm steadings have been built, and seventeen new slated dwelling houses and cottages. All new houses are slated, and are substantial and commodious. Old houses are chiefly thatched. Fencing is now nearly complete on the principal farms, wire being the most extensively used. During the past twenty-five years about 712 acres have been reclaimed by trenching, ploughing, and draining where necessary. The land

thus brought under cultivation was previously, for the most part, waste moorland, intersected here and there with small patches of arable land. These reclamations, which will in course of time be remunerative to the estate, were done chiefly by the proprietor, but in some cases the tenants assisted handsomely. In addition to these improvements the greater portion of the old land has been re-drained since 1850, and a considerable amount done in the way of squaring up farms and fields. In many cases the tenants on improving leases held waste land at 1s. 6d. per acre, and the holdings were profitable to them,—the proprietor's share of the profits coming in only at the expiry of the leases. Ordinary leases run from fifteen to nineteen years, but there are also life-rent leases, and life-rent leases to original holders and fifteen years to their successors. The incoming tenant gets possession of the grass, manure, fallow, and houses and gardens at Whitsunday, and of land under grain crop at the end of harvest, he having the option of taking the grain crop at its valuation. The ancient custom was for tenants to build on the system of meliorations; but now building is chiefly executed by the proprietor, the tenant paying either an increased rent or a percentage on the outlay. When a tenant builds at his own expense some special agreement is entered into. The rent per acre on farms held under ordinary leases varies from 15s. to 28s. per acre. Under old leases rents are collected at Candlemas, Martinmas, and Whitsunday, but under new leases at the latter terms only. The prevailing system of rotation is the ordinary five shifts,—two years grass, two grain crops, and one green crop. Most of the tenants keep cross cows, and rear their own cattle from these and short-horn bulls. The home-bred stock, which are supplemented when the markets suit the buyer, are kept on for grazing, and are fed off when two years' old. They are tied into the feeding stalls at the beginning of the previous October, and get abundance of swedes and a little cake. Probably more of this latter commodity might be used with considerable advantage to the feeder. There are no sheep farms on the estate; and the heather pasture, with the run of the arable land, is let to owners of Cheviot sheep as wintering. About 410 acres have been planted since 1850. Mr Mackenzie farms about 205 arable acres, and is a thoroughly practical, intelligent agriculturist. Farm servants are mostly single, or in the proportion of about three to one. The sons of the smaller tenants and crofters generally work as farm servants.

Mr George Maclean's estate of Drynie is small, but well managed and carefully farmed. It lies chiefly in the parish of Knockbain, but a small arm stretches into the parish of Killearnan. The arable land has been slightly increased of late, and various permanent improvements have been executed, chiefly by the proprietor. The rental during the past ten years has increased from

about L.1200 to L.1600. The majority of the farms are small, the Mains of Drynie being the only large farm on the estate. It is occupied by Mr James R. Mitchell, and is rented at L.714.

The estates of Kilcoy have been improved considerably during the past quarter of a century, chiefly by the draining of old land and buildings.

One of the largest farms in this neighbourhood is Kilcoy Mains, occupied by Mr William Murray. It extends to about 610 acres, all arable, and is rented at L.732. The rotation pursued in this neighbourhood varies—the fourth, fifth, and sixth shift being all worked upon. The five-shift rotation prevails, and is, on the whole, the most suitable for the district. The soil on Mr Murray's farm is mostly black loam on a rocky subsoil. A good many cattle are fed in the district, but on highly-rented land farmers complain that they cannot afford to breed cattle for themselves. Mr Murray generally buys in Cheviot lambs in the autumn, and, after wintering them, disposes of them to sheep farmers in spring. A few farmers in this neighbourhood keep a stock of cross or Cheviot ewes, and breed lambs from Leicester tups, selling them off in August. On the larger farms on this estate from 70 to 80 acres of arable land is allotted to a pair of horses, and on the smaller farms from 50 to 60 acres.

Another large farm on the Kilcoy estate is Belmaduthy, tenanted by Mr W. G. C. Asher, and rented at L.712. Mr Asher is an intelligent practical agriculturist, and works his farm on the most advanced principles.

The farm of Munloch and Braevil, also on the Kilcoy property, extends to 210 acres all arable, is occupied by Mr A. P. Smith, and is rented at L.364. The soil varies. In the valley of Munloch and Allangrange there is a good deal of stiff clay, a few fields of good black loam, and some moss. On the rising ground on either side the land is generally of a lighter quality; but sharp, and when in good condition is very suitable for all kinds of crops, wheat excepted. The five-course shift is pursued here. The heavier land suits wheat very well, and good crops are always certain if the season is favourable. Wheat, on an average, yields from 3 to 4 quarters per acre; chevalier barley from 3 to 5, and common barley from 3 to 5½, and oats from 3 to 6. Wheat seldom exceeds the standard weight—62 lbs. per bushel; barley weighs from 53 to 56 lbs., and oats from 40 to 43 lbs. The land intended for turnips gets a good strong autumn furrow of 8 to 10 inches in depth, and is in many cases sub-soiled besides to a further depth of 6 or 8 inches. In spring again it receives, according as it may happen to be clean or dirty, two, or perhaps three, cross ploughings, with corresponding harrowing, grubbing, and rolling, and has all the weeds collected and carted off. The land is then treated in the usual way, from

20 to 30 loads of farm-yard manure, and from 4 to 8 cwt. of artificial manure, chiefly dissolved bones and guano, being given to each acre. Swedes are generally sown between the 15th and the 30th of May, and yellows and whites between the 26th of May and the end of June. Of swedes about 3 lb. of seed are allowed to the acre, and of yellows and whites about 2½ lbs. Potatoes are not grown at any great breadth in this district. The land for potatoes is prepared in much the same way as for turnips, but they receive the best of the farm-yard manure, generally that which is made in summer, and also a little more liberal supply of artificial manure than turnips. Mr Smith keeps a breeding stock of cattle, and sells off his yearlings at from L.12 to L.13 a-head. About the end of autumn he also ties up twenty head of two and three year olds, which he buys in. The three-year olds are fed off at Christmas, and usually weigh about 6 cwt., and the two-year olds are sold off nearly fat about the month of April. The three-years olds, during the last six weeks of their feeding, get from 1½ to 3 lbs. of cake and a little crushed corn per day, and, after weaning his calves, Mr Smith gives each of them a pound of cake per day until they are sold. The farm servants in this district are mostly married, and cottage accommodation is now much better than some twenty or twenty-five years ago.

Proceeding along the Fortrose road, we pass through the parishes of Avoch and Rosemarkie. The principal proprietors in these parishes are Mr James Fletcher of Rosehaugh, Mr R. G. Mackenzie of Flowerburn, Mr H. M. Fowler of Raddery, and Mr C. M. M. Millar of Kincurdy. Though it is only about twelve years since Mr Fletcher made his first purchase of land in Ross-shire, he is now one of the largest proprietors in the county, his gross annual rental amounting to upwards of L.9000. About Martinmas 1864 he purchased the estate of Rosehaugh from Sir James Mackenzie for about L.145,000. This estate extends to about 6400 acres, and with the exception of some 200 acres has a pleasant southern exposure. Two years later Mr Fletcher acquired the estates of Bennetsfield and Ethie, both adjoining Rosehaugh, and extending respectively to about 500 and 1600 acres. Since then he has acquired the estate of Avoch (including the estate of Woodhead, in the parish of Resolis), from General Kirkland. It extends to about 1450 acres, to which are added about 650 acres of the Milbuie Common, called the Flowerburn Moor. Mr Fletcher's total acreage in the Black Isle is now no less than about 10,600 acres.

When Mr Fletcher obtained possession of Rosehaugh there were about 4013 acres under cultivation, about 900 under wood, nearly 200 under houses, roads, dikes and water, while the remainder, 887 was chiefly black moor and hills covered with heath

and broom. The soil on the greater portion of this waste land was found to consist chiefly of rich loam and strong reddish clay, and believing that it was likely to turn out well under cultivation, Mr Fletcher determined to give it a trial. Reclaiming operations were begun about six months after Mr Fletcher got possession, and in the course of about four years upwards of 600 of the 887 acres of waste land were brought under cultivation. The land was thoroughly drained in its natural state, the drains in general being about 30 feet apart and 3 feet 6 inches in depth. Stones were laid in the main drains, and tiles, chiefly from the Morayshire Tileworks, were used in the branch drains. The rougher patches of the land were trenched, but by far the greater portion was ploughed with strong subsoil ploughs, each drawn by three powerful horses. The land being naturally level and comparatively free from stones, a furrow was taken each way to the depth of about 12 inches. In the tract of land thus reclaimed there were a few acres of moss which had to be drained to a depth of 10 feet. But heavy as this undertaking was there was still heavier to accomplish in the way of draining. Loch Scadden covered between 5 and 6 acres at the east side of the property, and this sheet of water Mr Fletcher resolved to do away with. A large canal about 15 feet deep was formed through the centre of the loch, from which numerous branch drains stretched out on both sides. In this way the loch was thoroughly dried, and where water lay the richest crops are now grown. In addition to reclaiming these 600 acres, Mr Fletcher has thoroughly re-drained almost the whole of the old land. Such a large addition as this to the arable area of the estate, of course, necessitated a considerable outlay for building. Four or five complete new steadings were built, while the majority of the old steadings were extended and improved. Several handsome dwelling-houses have also been erected. During the first four years he possessed Rosehaugh, Mr Fletcher erected close on 15 miles of substantial stone dikes, and about an equal stretch of wire fencing. For outlay for fencing as well as on building the tenants pay 5 per cent. interest. Mr Fletcher also constructed several miles of accommodation roads, and spent a considerable sum in repairing the old roads of the district. In addition to the buildings which he erected for his tenants, Mr Fletcher spent upwards of L.700 in erecting a school and school-master's house on the Killin part of the property, a district that had hitherto been greatly in want of educational machinery. A very handsome and commodious mansion-house has also been built on Rosehaugh, while a considerable sum of money has been expended in beautifying the grounds, which now make Mr Fletcher's Black Isle residence one of the most charming country seats in the north of Scotland. Every acre, ay even every inch, that was not

considered worth reclaiming has been surface drained and planted; and when it is mentioned that, between 1864 and 1868, Mr Fletcher expended no less than about L.20,000 on improvements of various kinds at Rosehaugh, some idea will be had of the activity and stir that characterised the north-eastern point of the Black Isle during those four years. The cost of the reclamation of these 600 acres has been roughly estimated at from L.12 to L.15 per acre, according to the nature of the soil.

About one-half of the estate of Ethie was arable when Mr Fletcher obtained possession of it, and the other half was partly wood and partly waste moorland. The soil on this estate generally is very good, and altogether the property is a very desirable one. A very large breadth of land has also been reclaimed on this estate, while, as on Rosehaugh, every acre unsuitable for cultivation has been surface drained and planted. On his recently acquired estates Mr Fletcher has also been busy at work. In a word, every inch of a gross total of about 3300 acres of waste and improvable land which Mr Fletcher obtained along with his different estates has been either reclaimed or enclosed, drained, and planted, according to the natural qualities of the soil. Besides planting waste land he has, in re-arranging the farms, formed several beltings of wood through the estates, which in a few years will both beautify and shelter the land. Mr Fletcher advances money on interest to his tenants for suitable and permanent improvements—a privilege that has been largely taken advantage of. The leases of a considerable number of the farms were renewed recently, and in the new arrangement a large amount of building has been stipulated for. The total cost of new farm buildings at present in course of erection or in contemplation will be upwards of L.15,000; and altogether, since 1868, the bill for building, exclusive of the mansion-house, cannot be less than L.20,000.

The soil on Mr Fletcher's estates, generally speaking, consists of a heavy clayey loam, and in most seasons it grows excellent crops of all kinds. Wheat, however, is not very extensively grown. The course of cropping is the ordinary five-shift rotation. Part of the first year's grass is retained as hay, and the remainder is used as pasture. Farms range in size from 50 to 500 acres in extent, the average size being from 100 to 150 acres. The usual duration of leases is nineteen years, and rents are generally paid at Lammas and Candlemas. On those farms that were recently re-let, an increase of from 15 to 20 per cent. on the old rent was obtained. The rental per acre over the estates generally varies a good deal. In some parts it is upwards of L.2. The majority of both the farmers and the farm servants are natives of the district, and are generally quiet, industrious people. Married servants are now most in favour, but hitherto the number of this class of servants has been limited in consequence of a want of

cottage accommodation, which Mr Fletcher has already done a great deal to supply. A very good class of both horses and cattle is kept in the district, and altogether the farming of Mr Fletcher's estates is quite abreast with the times. Very large quantities of lime, chiefly taken from Banffshire, have been used on the estates within the past few years.

Mr Fletcher holds two of the largest farms on the estate in his own hands, the home farm of Rosehaugh, extending to 550 acres, and Muirhead of Ethie, the annual valued rent of which is L.500. The home farm of Rosehaugh is under the management of Mr Lawson, and is a model of neatness and regularity. The stock of cattle is one of the finest of the kind in the county. The cows hitherto bred from have been crosses of the best description, while the sires used have been selected, almost regardless of expense, from the finest shorthorn herds of the day. The Rosehaugh cross bullocks have been famed all over the north for several years, and at Inverness and elsewhere they have carried away many well-contested honours. A few shorthorn cows have recently been introduced, for the purpose of rearing pure bred bulls for the use of the tenantry. The improvements now going on on these estates are under the able superintendence of Mr Robert Black, factor to Mr Fletcher.

The estate of Flowerburn, a very desirable little possession, with a rental of about L.960, is divided chiefly into small farms, the rentals of which average from L.20 to L.195. Several little improvements have been effected on this estate since 1850. Mr Fowler's small estate of Raddery has also been considerably improved of late; and during the past eight or ten years, the rental has increased from about L.900 to L.1048.

Leaving the parishes of Avoch and Rosemarkie, we enter Cromarty; and here Lieut.-Colonel G. W. H. Ross is almost sole proprietor. The Cromarty estate extends to about 7946 acres—4112 arable, 2625 in pasture, and 1209 under wood. The soil is principally loam, but clay abounds in some parts, and moorish soil in others. The average rent per acre is about 33s., and the extremes range from 10s. to 60s. per acre. Since 1850 the rental of the estate, by reclamations and other improvements, has been raised from L5144 to L6128. The land reclaimed was previously under wood, and is of a moorish character. The present value of the new land is about 10s. per acre, and before reclaimed it was worth only about half-a-crown per acre. The reclamations cost about L.20 per acre, and will be fairly remunerative. The farms on the estate are mostly large—from 100 to 600 acres. The houses are good and substantial, and have almost all been built since 1850. Most of the fencing was done before 1850, while the greater part of the other improvements were effected shortly after that date. The system of rotation pursued

on the estate is either the five or six course shift, and the estate generally is farmed on the most advanced principles. Almost all the cattle kept are crosses, and are bought in when young, and fed off as two or three year olds. The estate is well provided with labourers' cottages. A few have been built since 1850, but the majority of them was erected previous to that. The farm servants are mostly married. There are a few crofters, who eke out the produce of their small holdings by working on the neighbouring farms. Since 1850 the whole of the available land has been planted. Leases on the estate are almost all of nineteen years' duration.

Three grandsons of the late Mr George Middleton, who came to Cromarty from Yorkshire about the beginning of the present century, occupy three large farms on the Cromarty estate. Davidston, now occupied by his son, of the same name, was leased for many years by the late Mr Jonathan Middleton, son of Mr George Middleton. The farm has a northern exposure, but still the soil is good, and naturally dry and fertile. Its arable area was greatly increased by Mr George Middleton, while the late Mr Jonathan also added a considerable breadth. The farm is now worked on a six-shift rotation, to suit the cultivation of potatoes, which have been found to be most remunerative for several years back. Mr Middleton "soils" a good many cattle (*i.e.*, feeds them in the house during summer on cut grass and cake), and has thus the command of a very large quantity of farm-yard manure of the very finest quality. In addition to a large dose of this dung, potatoes and turnips get from 7 cwt. to 9 cwt. per acre of artificial manure; while about one-half of the turnips are eaten off the land by sheep. Only as many cows as supply the farm with milk are kept, but a great many cattle (chiefly Caithness stirks) are bought in, as the markets are found to suit, and fed off both in summer and winter. Several hundreds of Cheviot lambs are bought in every autumn, and fed off on grass, turnips and cake. Rosefarm, another desirable farm on the Cromarty estate, and almost adjoining Davidston, is leased by Mr Alexander Middleton. The soil on this farm is mostly good black loam; but some patches here and there want "body." The five-course rotation is generally followed, though a small portion of the farm is worked in six shifts, to admit of a few potatoes being grown. No cattle are bred here either, but a good many are grazed and fed off at Christmas and about February, the byres being again filled during the spring with lean animals, as feeders for the following winter. About 1000 Cheviot lambs are bought in every autumn, and part are disposed of the following spring, and part retained and fed off on turnips and grass and cake as wethers. Very nearly one-half of the whole turnip crop is eaten off the land by sheep. The general custom

of the district is to feed half or three-part bred sheep, but Mr Middleton found that the turnips and grass which grow on his farm are not rich enough in feeding qualities for sheep of these varieties, and consequently he has taken to Cheviots. The late Mr Jonathan also had this farm for several years, and reclaimed nearly one-half of it from moor and wood; while his son, Mr Alexander Middleton, who has been tenant of the farm for about twenty years, has also reclaimed about 100 acres. Mr Middleton also leases the farm of Poyntzfield, on the estate of that name, and in the parish of Resolis. The exposure here, as at Rosefarm, is northern, but the soil is very fair. The system of rotation pursued here, and the working of the farm generally, is exactly the same as at Rosefarm. When Mr Middleton became tenant here, about ten years ago, the land was in very bad order; but since then he has drained the whole of it, erected some six or seven miles of wire fences, limed the whole farm, and reclaimed about 30 acres from waste moor land, all at his own expense. The 30 acres reclaimed were previously covered with small whin bushes, and Mr Middleton's first step was to tear out the whins with a grubber. The land was then ploughed and drained, and well limed; and now that it has passed through one rotation, it has the appearance of being good useful land. It was under oats last season, and yielded about 5 quarters per acre, though the bulk the crop had in the stook would have led one to expect even a higher return. The compact, neatly laid off farm of Farness, which adjoins Davidston, and to which is attached the small farm of Peddieston, is held by Mr Thomas Middleton, another of Mr George Middleton's grandsons. Farness is worked by four pairs of horses, on five shifts—two years grass, oats, turnips, and wheat sown out with grass seeds. Mr Thomas Middleton entered this farm fourteen years ago, and since then he has built a very handsome dwelling-house, and encircled it by a magnificent garden; removed the farm-steading from an inconvenient site to the centre of the farm, making it considerably larger than before; has erected about 1000 yards of stone dykes, and between 6000 and 7000 yards of wire fences; made nearly a mile and a half of service roads; drained a considerable part of the farm; trenched-ploughed the whole of it, and squared up several of the fields. For the erection of the dwelling-house, a forehand rent (about L.340) was returned to him; and for the stone dykes erected he receives meliorations at the end of the lease, to the extent of about L.200. The soil on Farness is good black loam, and yields excellent crops of wheat, oats, and turnips. Wheat usually yields about 4 quarters per acre, and oats from 5 to 6 quarters. The turnips are manured with about 25 loads of farm-yard manure and 8 cwt. of superficial manure, including about 1 cwt. of nitrate of soda. Mr Middle-

ton keeps just as many cows as supply the farm with milk, and buys in cattle (chiefly Caithness stirks or two-year olds) all the year round. The cattle courts are covered, and very conveniently arranged for feeding; and for two years back he has been "soiling" a good many cattle. In all, he feeds about 70 cattle, in two lots, sending the one away about Christmas, and the other about June. About 400 Cheviot lambs are bought in about the month of August, grazed till December, fed on turnips from then till April, grazed during the following summer, and fed on turnips and a little cake from October till January, when they are sold fat at about L.3 a head. None of the grass is pastured by cattle, the whole being either eaten by sheep, cut for hay, or cut and carried to the cattle courts for "soiling" purposes.

The compact, little, but valuable estate of Udale, belonging to Mr George Mackenzie of Poyntzfield, and leased as one farm by Mr James Gordon, lies in this parish. It is beautifully situated on a pleasant slope running down close to the Cromarty Firth, and has for several years been one of the best farmed holdings in the counties. It extends to about 450 acres, of which 270 are arable, the remainder being partly under wood and partly moorland. The farm faces the north, and rises from sea-level to a height of about 400 feet. The soil varies a good deal. On the fields that lie under a level of about 100 feet, it is principally shingly, with a gravelly bottom overlying the Old Red Sandstone, which is here covered to a considerable depth. The middle fields, lying between 100 and 200 feet above the sea, consist of a rich deep black loam close to the sandstone. On some parts of these fields the Old Red Sandstone comes within 3 or 4 feet of the surface, and here the soil is a strong reddish clay, suitable for all kinds of crops, though probably not quite so safe for potatoes as the more gravelly land. On the higher fields the soil is of an inferior class, and consists chiefly of a moorish boulder clay, with here and there an iron pan underlying it. Mr Gordon is an extensive stock farmer, and to suit his cattle and sheep endeavours to have as much grass in summer and as many turnips in winter as possible. The system of rotation pursued is therefore rather an exceptional one. He generally allows the land to lie three or four years under grass, and breaks it up for a crop of turnips, the farm-yard manure being spread on the lea before being ploughed down in winter. After turnips comes either wheat or oats, or oats and tares mixed, the mixture being used for feeding stock. Then turnips follow again, and after that wheat or oats sown out with grass seeds. The system is confined to the heavier soils. The lighter soils are broken up with either potatoes or oats, followed by turnips, and then oats with grass seeds. A portion of the lighter land on the heights was found unsuitable for turnips, and consequently it was sown down with whin seed

along with oats, about 30 lbs. being given to each acre. The whins came away beautifully, and for seven years running from 10 to 12 tons per acre were reaped every season. The sub-soil in these higher parts is very fair clay, and the roots of the whins must have abstracted nourishment from it. The whins were used for horses, cattle, and sheep, and it was curious to observe that the pure bred shorthorns and Leicesters took more readily to the whins than the other kinds of cattle and sheep. The whins were reaped with one of Samuelson's mowers, the same implement having reaped a field of 22 acres for five years in succession. Before being given as food, the whins are put thrice through a whin-mill, made by Messrs Mackenzie & Co., Cork. The first of the crop is used about the beginning of November, and unless caught on the root by a severe frost, which make the whins woody and tough, they are quite soft and easily eaten. Cattle and horses get them under roof, but to sheep they are supplied in troughs on lea fields. The cultivation of these whins enabled Mr Gordon to carry a heavier stock of both cattle and sheep than he could otherwise have done; and by their roots having pierced through and loosened the firm pan which underlies the soil on these higher fields, the parts on which they were cultivated have been permanently improved. Of the 22 acres sown down with whins 12 were ploughed to the depth of about 8 inches last spring, and sown with oats. The crop was a very fair one, and yielded about 4 quarters an acre—the highest yield ever reaped from the field.

Mr Gordon grows no barley, but produces both wheat and oats of the finest quality. As much as 8 quarters of wheat per acre have been grown on the farm, while the general yield runs from 3 to 5 quarters per acre. The weight per bushel varies from 60 to 62 lbs. Chiddam and Fenton are the varieties used, about 4 bushels of seed being given to the acre. The Fenton variety generally affords the largest yield. The wheat is sown in autumn as soon as the turnips are eaten off the land by sheep. Finefellow is the variety of oats most largely sown. The yield of oats varies from 3 to 7 quarters per acre, and the weight from 42 lbs. to 43 lbs. per bushel. About 4 bushels are given as seed to the acre. A broadcast-sowing machine and manual-delivery reapers are employed. As already stated, two turnip crops are taken in each rotation, one after lea and another after stubble. Mr Gordon never cross-ploughs any, but grubs thoroughly. When he obtained possession of Udale about eleven years ago, the land was very dirty, and at the first rotation a considerable amount of labour had to be spent in clearing away large quantities of weeds. The soil, however, is now thoroughly clean, and in a very high manurial condition. Mr Gordon begins to sow turnips about the 10th of May, and gives about 3 lbs. of seed to

each acre. About two-thirds of the turnip break is usually put underswedes. Besides from 15 to 25 loads of farm-yard manure per acre (spread on the surface before ploughing), a very heavy dose of artificial manure is applied. The dose ranges from 6 cwt. to 12 cwt. per acre, and is composed of bone meal, crushed bones, coprolite superphosphate, muriate of potash, nitrate of soda (not more than 1 cwt.), and common salt. Considerable quantities of seaweed are also used for manuring both turnips and potatoes. As might have been expected from the very short interval between the two root crops in the rotation, a good deal of loss was at first experienced by "finger and toe," but by the application of the above-mentioned mixture the ravages of this destructive plague have been completely checked. Mr Gordon gave special attention to the cultivation of turnips for some years, and has been very successful in his experiments. He attributes the prevalence of "finger and toe" throughout the country chiefly to the fact that in the mixture of artificial manure usually applied to turnips, all those ingredients necessary for nourishment to the plant are not present in the requisite proportions. He has grown three crops of turnips in four years, with but very little appearance of "finger and toe;" but this he thinks could be done only when then turnips are eaten off by sheep, by which system a good deal of what the turnips absorbed from the land during growth is returned to it in the sheep-droppings. Mr Gordon generally grows from 12 to 15 acres of potatoes, chiefly Victorias. The potatoes are usually planted on the lighter and more gravelly land, and get about the same quantity of manure as the swedes, except that the potash is slightly increased. Mr Gordon has cultivated a few new varieties from the plums of Victorias, which now afford a larger return than the original variety. The farm is worked by four pairs of good substantial horses. For some years Mr Gordon kept a stock of cross cattle, breeding from polled cows and shorthorn bulls, but since 1871 he has been devoting a good deal of attention to shorthorn breeding. Of the shorthorns, however, more anon. Mr Gordon has for many years been one of the most extensive sheep farmers in the counties, and in addition to a large mixed stock of sheep, he has been rearing a few pure bred Leicesters. Of these, also, more anon.

Towards the end of last year Mr Gordon purchased the estate of Arabella from Mr Fraser. It extends to about 600 acres, is almost all arable, and lies in one of the prettiest spots in Easter Ross. The land is very level, and the soil is rich alluvial clayey loam, close but not stiff, and if properly cultivated should grow heavy crops of all kinds. The alluvial soil lies on 6 or 8 inches of sand, and beneath that is a layer of strong blue clay. The land has been imperfectly cultivated for some years, and is full of weeds and rather rough. The course of cropping followed

by the late tenant was either one or two years grass, wheat, oats, turnips, and either wheat or oats sown with grass seeds.

The next parish we enter in the Black Isle is Resolis, part of which lies in Ross-shire and part (the larger part) in Cromarty. The principal proprietors in this parish are Mr J. A. Shaw Mackenzie of Newhall, Mr George Mackenzie of Poyntzfield, Mr C. Lyon Mackenzie of St Martins, Mr H. K. Fraser of Braelangwell, Captain J. D. Mackenzie of Findon, and Mr J. Urquhart of Kinbeachie. The Newhall property contains two large farms, Kirkton and Mains of Resolis; but a very large portion of the estate is taken up by crofts, which number close on 100. A few of these crofters pay half-a-crown of rent, while others pay L.8, L.10, or L.12. The crofts are chiefly situated on the Bog and Muir of Cullicudden; and by many years of patient toil the tenants of these small holdings have added considerably to the arable area of the estate. They have almost all leases of nineteen years, and, generally speaking, they live comfortably and contentedly. The extensive farm of Mains of Braelangwell, for some time occupied by Mr John Gordon, now in Balmuchy, lies in this parish, as also the desirable farm of Mains of St Martins.

Proceeding along Cromarty Firth, in the direction of Dingwall, we pass into the parish of Urquhart, in which the larger proprietors are Mr Arthur Forbes of Culloden, Sir Kenneth S. Mackenzie of Gairloch, Bart., and Captain J. D. Mackenzie of Findon.

The estate or barony of Ferrintosh, extending to close on 6000 acres, though situated in the parish of Urquhart, really belongs to the county of Nairn. It is owned by Mr Arthur Forbes of Culloden, and within the past thirty years has been improved to a very great extent. In 1853 Mr Duncan Forbes, brother of the proprietor, reported to the Highland and Agricultural Society (see "Transactions" for 1853, series iii. vol. vi.) on extensive improvements that had been carried out on the Ferrintosh estate under his own management. Between 1847 and 1853, 672 acres were reclaimed from rough, stony moorland and brought into profitable cultivation. The greater portion had to be trenched, at a cost of from L.7 to L.8 per acre, and before it was thoroughly drained, cleared, and fenced, and prepared for cropping, the total cost per acre ranged from L.20 to L.23. The drains were cut to a depth of 3 feet, and laid with horse-shoe tiles, upon the top of which was placed a layer of about 14 inches in depth of small stones. For leaders 4 and 5 inch tiles were used, and those placed in the branch drains were about 2 inches. Where stones could be had dykes were made, wire being used where stones was scarce. And since these improvements, reported upon so fully by Mr Duncan Forbes, were completed, extensive improvements, in the way of reclaiming, draining, fencing, building, &c., have

been effected. In 1874 the leases of about 120 crofts expired, and, on a measurement of these holdings, it was found that during their leases, which ranged from fifteen to nineteen years, these small tenants had reclaimed upwards of 400 acres, all of which had been thoroughly drained and partly fenced. These crofters had also drained and fenced the greater portion of their old land during their leases recently concluded, and by aid from the proprietor they had also done a good deal in the way of building. The gross rental has been doubled within the past twenty-five years; and in many cases, where the land was good, a considerable increase has taken place in the acreage rental. The tenantry, generally, are in a thriving, prosperous condition; and we should mention that, with one or two exceptions, the whole of the 120 crofters, whose leases expired in 1874, retained their possessions and accepted agreements, under which they are bound to reclaim at least one-tenth part of the moorland on their holdings. The waste land, though thin and moorish in some parts, is so well suited for potato culture, and otherwise so suitable for improvement, that the conditions of the new leases are certain to be carried out very soon. While the improvements on the crofts have been important, those on the larger farms have been still more extensive. Offices and dwelling-houses of a superior description have been erected at Cornton, Tergorm, Leanaig, Easter and Wester Alcaig, Kinkell, Drunoureach, Dunvornie, Teanalmich and Teanagain, &c. There are two steam-mills on the estate, one at Balnabeen and another at Wester Alcaig, but as a rule the tenants use water power for their thrashing mills. Almost every tenant who has any waste land attached to his holding sits under an improving lease, and there is every prospect of a good deal of reclaiming and other improvements being accomplished before the end of the current leases. Plans have been made and levels taken for clearing the high lands of large lakes of stagnant water, which, when carried away, will render a great deal of land improvable; and arrangements have also been completed to enclose for planting a large portion of the waste land on the top of Milbuie, belonging to the property.

One of the principal farms on the Ferrintosh estate is Rye-field, occupied by Captain A. S. C. Warrand. It extends to about 320 arable acres, and about 50 acres of pasture. The soil is a medium loam on freestone rock, and the rent about 30s. per acre. A five-course rotation is pursued,—1st, Oats; 2d, turnips, $\frac{3}{4}$ being swedes; 3d, wheat and barley; 4th, hay ($\frac{1}{3}$) and pasture; 5th, pasture. Oats usually yield about $5\frac{1}{2}$ quarters per acre, and weigh 42 lbs. per bushel; wheat yields $3\frac{1}{2}$ quarters, and weighs 62 lbs.; barley yields about 5 quarters, and weighs 55 lbs.; turnips average about 30 tons per acre, and the hay crop is usually good, and pasture fair. The land intended for turnips

is ploughed parallel to old furrows in autumn, from 10 to 12 inches deep. In spring it is ploughed across, or, if dirty, is first grubbed and then ploughed across, and thoroughly harrowed and cleaned of weeds. The land is manured with 20 loads of farm-yard manure, with a cwt. of crushed bones, 2 cwt. of bone meal, $1\frac{1}{2}$ cwt. of dissolved bones, and $\frac{1}{3}$ cwt. of nitrate of soda to each acre. Swedes are sown from 15th to 25th May, and yellows from 25th May to 12th June. Potatoes are grown only for home consumption. Captain Warrand has fenced the whole of his farm, and partly drained and reclaimed about 10 acres, all at his own expense. About fifteen cross cows are usually kept, and from these and a shorthorn bull excellent cross calves are reared. Five or six calves are bought in for fostering at a week old, while four yearlings are also bought in, and thus twenty-four two-year olds are sold off every year. About half this number is fed to an average weight of about 6 cwt. by February, when they are despatched to the beef market. The other twelve are sold off when about half fat. Those intended to be fed out are tied up about the 1st of October, having had turnips previously given to them on the open field. The diet till Christmas consists of yellow turnips and a mixture of wheat, barley, oat, and Indian corn meal; and after that swedes are substituted for the yellows, and a little linseed cake added to the meal. The cattle bred at home are found to be the best paying animals. About 200 Cheviot and half-bred ewes are now kept on the farm, and Captain Warrand expects to sell 280 lambs every season. He allots 80 acres to each pair of horses. Cottages are scarce, and therefore unmarried servants are in the majority. Captain Warrand kept a very fine stock of pure bred Leicesters for several years, but in September last the whole hirsels was dispersed at very high prices.

The largest farm on the estate is Connton, occupied by Mr George Middleton. It extends to about 400 acres, all arable, and is rented at about 28s. per acre. The soil is light sandy loam, and the climate is good. The ordinary five-course rotation is pursued. The various crops yield well, except in dry seasons. Wheat usually yields about 4 quarters per acre, and weighs from 61 to 62 lbs. per bushel; barley yields 5 quarters, and weighs 55 lbs.; and oats yield $5\frac{1}{2}$ quarters, and weigh from 41 to 42 lbs. The grain is usually of the finest quality. The land intended for turnips, if not dirty, gets one deep furrow in autumn and a cross-ploughing in spring; but, if dirty, it is grubbed once or twice before being ploughed in spring. About 15 tons of farm-yard manure, and from 5 to 7 cwt. of artificial manures, principally bone compounds, are usually applied to the acre. Mr Middleton has recently been trying the system of spreading the farm-yard manure on the stubble land in autumn, to be turned over with

the first furrow, and as yet the results have been favourable. As already stated, the farm has been considerably improved since 1850 by reclamations, draining, fencing, and building. A "flying" stock of cattle is kept. They are bought in once a year, and sold off fat from January to April, weighing generally about $6\frac{1}{2}$ cwt. No cattle are bred on the farm. A little cake is used, but for feeding turnips are supplemented chiefly by a mixture of meal made from the different varieties of grain. A small flock of half-bred and three-parts bred lambs are bought in in August. As they are newly weaned when bought, they are treated as kindly as possible for some time on good grass, and soon after the 1st of January cut turnips are given them, and after the 1st of May a little cake is added. They are clipped about the 26th of May, and sold off in June. The farm horses in this district are Clydesdale crosses, very much improved of late, but still short in supply. About 80 acres are usually allotted to each pair. Married servants are in the majority as yet, but married men are becoming scarce. Rents in this district have risen from 30 to 40 per cent. at the expiry of each lease; but now, when labour and taxes are so high, there is not much room for a further increase. We might be asked, Is this rise of rent due to improved tillage of the original acreage? or to an increase of the arable land by reclamation? or to a diminution of the farmer's profits? We think that the rise is due partly to all these three causes, but mainly to the former two. The rents of several farms, on which there have been no reclamations for many years, have advanced upwards of 20 per cent. since 1850, and in these cases the rise is mainly due to improved systems of farming.

Sir Kenneth Mackenzie's beautifully situated estate of Conan comprehends the western end of the parish, and has been immensely improved by reclamation, draining, fencing, and building, both by the present proprietor, and by the late Sir Francis A. Mackenzie of Gairloch, who is spoken of in "The New Statistical Account of Scotland," as being "distinguished for zeal in agricultural improvements, as respects both the reclaiming of waste ground and introducing the modern system of husbandry among his servants." Sir Kenneth is convener of the county of Ross; and is a painstaking practical agriculturist, and a considerate landlord. He holds the home farm of Conan in his own hands; and under the careful management of Mr Mackenzie, the overseer, it is kept in a high state of cultivation. It extends to about 400 acres, of which 340 are arable, and 60 under permanent pasture. The soil is partly black loam, and partly sandy loam, with a subsoil of sand. The ordinary five-shift course is pursued, wheat being taken after turnips and potatoes. From twelve to fourteen thoroughly good cross cows are kept; and from these and a shorthorn bull excellent cross calves are

reared. The bull in use at the farm just now was purchased from Mr R. Bruce, late of Newton of Struthers, Forres. Two or three good pure bred shorthorn cows are also kept at the farm. A good many cattle are fed during winter; and a large lot of pure Berkshire pigs are reared and fed in the courts at the steading. From 400 to 500 cross ewes are pastured on the farm; and from these and Leicester tups a crop of lambs is raised every year that commands the top prices at the Inverness Wool Fair. The steading on the home farm was built in 1822; and it is worthy of remark, that Hugh Miller worked at it as an apprentice mason. The entrance into the steading is surmounted by a tall handsome tower. Sir Kenneth has also an extensive estate in the parish of Gairloch, his rental there alone amounting to L.7300. There are a few small-sized arable farms on the Gairloch property, and between 400 and 500 crofts, averaging about five acres in extent. A good many of these crofters have reclaimed the whole of their possessions, while others have improved little more than one-half. The system of cultivation on these and other crofts throughout the counties will be noticed more fully afterwards.

The Findon estate has been very considerably improved, by reclaiming, draining, fencing, and building of late; and during the past eight or nine years the rental has increased from L.3774 to L.4624. There are a great many crofts and small farms on this estate, and some large and very fine farms. The largest farm on the estate is Woodlands, situated in the parish of Kiltearn, and occupied by Mr Jonathan Middleton, Davidston, at a rent of L.555.

Continuing round towards Beaulie Firth, we pass through the parish of Kiltearn, which joins Knockbain, near our starting point on the Black Isle. The large proprietors in this parish are—Mr Mackenzie of Kilcoy (whose estates have already been noticed), and the Right Hon. Henry J. Baillie of Redcastle. The improvements on the Redcastle property since 1850 have been extensive, important, and costly. A considerable extent of land has been reclaimed, while building, draining, and fencing have been going on apace. The rental since 1868 has increased from about L.5800 or L.6500.

We have now made a complete circuit of the Black Isle; but before taking leave of the peninsula, we must refer shortly to the old "Mulbuie Common." This immense tract of land, extending to 7044 acres, stretched along the whole top of the Black Isle, and for hundreds of years was used as a common outrun for the Black Isle generally. It was originally covered with little else than black heath, and its pasture was of no great value. It was asserted that the soil, over at least the greater portion of the common, was quite suitable for improvement, and likely to make very fair arable land; but while it remained the property of no

man, because the property of all, nothing could be done by way of either reclaiming or planting. Several attempts were made among the proprietors of the Black Isle, nearly a hundred years ago, to have Mulbuie divided, but new difficulties were continually cropping up, and proposal after proposal fell to the ground. By agreement among themselves, a few of the proprietors, towards the west end, made a sort of an interim division of what lay opposite their possessions; and part of the land thus apportioned off was planted. Before the present century had advanced many years, the agitation for division again manifested itself, and this time with more success. The subject came up in the Court of Session, and on the 10th July 1827, the then Lord Ordinary (Mackenzie) issued an interlocutor, dividing the whole commonty (including what had been already extra-judicially apportioned) among the various proprietors in the peninsula. The royal burgh of Fortrose claimed a right of commonage, and on the division got the largest portion of any, namely, 687 Scots acres. To the Cromarty estates 577 Scots acres were apportioned, 550 to Kilcoy, 523 to Flowerburn, 446 to Sir James Mackenzie of Scatwell, 411 to Newhall, 370 to Ferrintosh, 358 to Redcastle, 245 to Allangrange, 196 to Conanside, 158 to Drynie, 127 to Avoch, the remainder going in smaller portions to the other proprietors in the district.

That the division of this commonty had beneficial results there can be no doubt. A great extent of the 7000 acres has been brought to produce very fair oats, turnips, and potatoes; while, with a few exceptions, almost all that was found unsuitable for reclamation has been planted, and is now carrying thriving wood. There is still a considerable extent of moor and waste land throughout the Black Isle; but compared to the immense tract that existed before the division of Mulbuie, it seems little more than a mere handbreadth. The improvement these reclamations and plantations have effected on the scenery of the Black Isle is very marked. Before the division a dark dreary shade was cast over the whole peninsula by the bleak heathy moor, which then ran along the ridge; now, the many green fields and thriving plantations that occupy the greater part of old Mulbuie, lend a pleasant, smiling aspect to the whole district. The greater portion of the better land, after the division, was let to crofters, in holdings varying from 10 to 30 acres. In most cases leases of nineteen years' duration were granted to these crofters, and other substantial encouragement held out to them to bring their holdings under cultivation. By patient toil and untiring energy, these small tenants have reclaimed many hundreds of acres, and converted into a pleasant agricultural district what was before a wilderness of stunted heath and bent. The soil generally is light, and very susceptible of drought, but

still very fair crops are usually grown, and the majority of the crofters live comfortably and contentedly.

The 196 Scots acres allotted to the Conanside estate formed part of what had been previously divided and planted; and the wood was not removed for about ten years after the division in 1827. In 1841 this land, extending to about 245 imperial acres, was let, along with 20 acres of adjoining land, at a rent of 1s. 6d. per acre, on leases of nineteen years, to fifteen crofters who undertook to reclaim the whole, receiving therefor L.5 for each acre of improved land at the close of their leases. Some of these crofters, notwithstanding this encouragement, did nothing; others improved only part of their land; while some improved the whole during the first lease. By 1860 about half the improvable land had been reclaimed; and at that time new nineteen years' leases were entered into at an average rent of 14s. per arable acre, and 1s. 6d. per acre of waste land, with the L.5 premium on its improvement. But practically most of the crofters sit at about 6s. per arable acre, having sunk this melioration for a reduction of rent equivalent to 8 per cent. on the L.5 per acre to which they were entitled. By 1878, when the leases again expire, most of the land will be under rotation. This piece of land is probably one of the worst on the whole commonty. The soil is light and gravelly, the rock underlies it at no great distance from the surface; and the crops are always light, and suffer much from drought. In fact, very few of the wells retain water all through a dry summer; and at the present rate of wages it can be profitable neither to the landlord nor the tenant to reclaim and cultivate land of such inferior quality. Sir Kenneth lately trenched and brought into cultivation about 40 acres of waste land adjoining these crofts, from which he now receives a rent of L.1 per acre. The land was worth about 8s. per acre before being reclaimed, and when under heath as wintering for hill sheep. The increase of rent is thus only 12s. The cost of the improvement, including cleaning and draining and building, came to about L.24 per acre, so that the interest received on the outlay is only 2½ per cent. From the improvement of a similar subject Sir Kenneth would not now realise even this profit; and really it is very doubtful whether or not such an unremunerative speculation is worth the toil and trouble of the crofter. There was a good deal, however, of richer land on other parts of Mulbuie, and on most of these parts both the landlords and tenants have been very fairly remunerated for their outlay and labour. The 306 imperial acres attached to the Allangrange estates have almost all been made arable, and are now producing very fair crops of oats, potatoes, and turnips. The greater portion of this piece of the old commonty was given off in crofts and improved by these small tenants, as was the case with the land apportioned to Sir Kenneth.

The whole of the 577 Scots acres attached to the Cromarty estates have been planted, and are now carrying valuable wood; and of the 370 apportioned to the Ferrintosh property, part has already been planted, and part reclaimed by crofters, while arrangements have now been completed for having the remainder enclosed with a view to its being planted.

Mid Ross.

Mid Ross proper includes all of the Black Isle that lies in the county of Ross, as well as the parishes of Urray, Contin, Dingwall, Fodderty, Kiltearn, and Alness. But for convenience, the Black Isle was taken separately. By train the traveller enters Ross-shire near the Muir of Ord, in the parish of Urray. Part of this parish lies in Inverness-shire, but by far the greater portion is in the county of Ross. The principal proprietors in the Ross-shire portion of the parish are Mr J. A. F. H. S. Mackenzie of Seaforth, Mr John Stirling of Fairburn, Mr James F. Gillanders of Highfield, the Right Hon. H. J. Baillie of Redcastle, Mr Thomas Mackenzie of Ord, Mr A. J. Balfour of Strathconan, and Mr J. S. Chisholm of Chisholm, who owns the estate of Rheindown. The Ord estate, though not very extensive, has, nevertheless, been the scene of great activity and enterprise for many years, and is now one of the best farmed little properties in the county. The Rev. James Macdonald, writing on the parish of Urray for the New Statistical Account of Scotland in 1841, says, "The principal agriculturist within the parish is Mr Mackenzie of Ord, who has improved his lands very much of late." And since then the value of the estate has been very much increased both by reclaiming new land, and draining, and otherwise improving the old. The rental in the parish of Urray in 1840 was L.342, now it is L.1494.

The estates belonging to the Seaforth family have been considerably reduced by selling off detached portions during the past twenty-five years; but on what still attaches to Brahan Castle (the beautifully situated residence of the family), a good many improvements have been effected of late, while the general system of husbandry pursued on the estate is of the most advanced description. The estate of Highfield has also been very largely improved within the past twenty-five or thirty years. In 1840 the rental was L.402; in 1868, L.1895; now it is L.2315. The Rheindown estate has advanced in rental during the past eight or ten years from L.540 to L.615.

Last year Mr John Stirling purchased the estate of Fairburn from the Seaforth family, the estate of Anchonachie from Mr Douglas Mackenzie, and the estate of Muirton from Mr Robert Ainslie. These estates adjoin each other, and lie in the valleys of the Conan and the Orrin. Their united rental is L.350.

These estates had all been very much improved by their respective owners before coming into the possession of Mr Stirling. The arable land, particularly on the Fairburn estate, had been increased by hundreds of acres; many new steadings had been built, the farms all squared up, and an immense stretch of wire and other fences erected, while almost every acre of land unsuitable for reclamation was planted. On the Fairburn estate there are upwards of 1200 acres of excellent planting, the main portion of which was planted by the present laird of Brahan and his mother. The system of rotation on Mr Stirling's estates is chiefly the five shifts. A good many cattle are reared and grazed in the district, and in this respect it forms one of the few exceptions to the general rule of Ross-shire, which is the buying in and feeding of cattle, not rearing and grazing. A very large portion of the turnip crop is eaten off the land by sheep, chiefly Cheviot hill hogs. The largest and most expensive of all the improvements effected within recent years by the Seaforth family was the draining of the bog of Arcan, on the Fairburn estate. Mr John Mitchell, provost of Dingwall, whose experience in land improvements is very extensive, had the planning and superintendence of this gigantic undertaking; and, on its completion some twenty years ago, he reported upon it to the Highland and Agricultural Society. This report—a complete and very interesting one—will be found in seventh volume of the third series of the Transactions of the Society, at the 108th page; and therefore lengthy reference to the subject here would be superfluous. A great extent of land, in what was called the Bog of Arcan, lies at such a low level, that originally it was continually in a wet marshy state, and frequently completely submerged by the overflowing of the Conon; and notwithstanding the care and skill employed in the undertaking by Mr Mitchell, and the money expended, large portions of the lower lying parts of the bog again began to be almost useless in consequence of flooding and back-lying water; and some ten years ago an attempt was made to redrain the land. First of all, a large culvert, about 3 feet in diameter and about a mile long, was constructed from a convenient point in the bog away seawards, and discharging itself into the Conon. The construction of the culvert was a matter of very great difficulty, and the expenditure for this part of the work alone amounted to between L.7000 and L.8000. Branch drains were cut from the culvert throughout the whole of the marsh, and in this way close on 500 acres, that formerly were almost useless, are now bearing the richest grain and root crops of all kinds.

Lying alongside Urray is the parish of Contin, a very extensive parish containing some very fine arable land, and a large extent of hill grazings. The principal proprietors in these parishes are Sir A. G. R. Mackenzie of Coul, Bart., Mr A. J.

Balfour of Strathconon, and Mr Mathieson of Ardross. The most of the arable land on the estate of Coul lies in the Contin valley, one of the prettiest of straths. A gentleman who has been a resident in this valley for many years writes—"From my windows I can see at a glance about 1400 acres of land, reclaimed within the last thirty years, now bearing rich crops of all kinds. One old farmer in my neighbourhood actually took in 400 acres himself. All the modern improvements, such as using reapers and artificial manures, are greatly in vogue, by which reaping is much accelerated, and crops greatly improved." In 1868 the rental of the Coul estates in Contin was L.3766, now it is L.4180. One of the prettiest situated farms on this estate is Achilty, occupied by Mr P. Robertson, and lying along the banks of the Black Water, around the base of Tore-Achilty, a rugged perpendicular elevation looking down the valley of Contin, and beautifully covered with richly foliated weeping birch. The farm extends to about 300 acres arable and 100 acres pastoral, and is rented at L.300. Mr Robertson also holds several sheep farms, but these shall be referred to afterwards. The soil on Achilty is chiefly sharp light brown loam, slightly mixed with sand. The five-course shift is generally followed, though occasionally it is varied into a six shift-rotation. Turnips are sometimes grown after lea, and they are found to do very well. In November of 1874 a six-year old field of grass was ploughed, and in the spring sown with yellow turnips, manured liberally with bone meal and dissolved bones. The plants came away very satisfactorily, but mildew interfered with them towards the end of summer, and the crop turned out only a moderate one. The turnips were all eaten off by sheep, and the land ploughed again in April across the old drills. In the end of May it was thoroughly harrowed, and the sods reduced to a fine tilth. It was then drilled up, manured with about 7 cwt. per acre of crushed and dissolved bones, and sown with turnips. The crop was still in the field when we visited Achilty, and the appearance was most promising. Barley is generally grown after turnips, and oats after grass. The average yield of barley is from 4 to 6 quarters per acre, and the weight from 53 to 54 lbs. per bushel. The yield of oats ranges from 5 to 6½ quarters, the weight from 42 to 43 lbs. The favourite variety of barley is chevalier, while sandy oats are grown almost entirely. These remarks apply pretty generally to the whole of Contin valley. Mr Robertson keeps four or five cows to supply the farm with milk, and rears six calves. He buys in from forty to fifty Highland heifers in October. They are wintered at Achilty, sent to the hills to graze during summer, and sold when the markets are favourable.

The Strathconon estate extends to about 72,000 acres, chiefly hill ground taken up by a deer forest, sheep farms, a few crofts,

and a home farm. It extends in three parallel glens, from Glen Orrin to the Dingwall and Skye Railway, only the south side of Strathbran belonging to Mr Balfour. The river Meig, a tributary of the Conon, runs through the centre glen of Strathconon. It is only 16 miles from the Muir of Ord, and 20 miles from Dingwall and Beauly, but still the estate is very much isolated; nevertheless, it has been greatly improved within the past thirty years. The glens are so very narrow, and the rivers so tortuous in their courses, that there is really little room for reclamations of any extent. On the home farm there are about 60 acres under rotation, and here and there along the river sides there are small patches of arable land. In fact, almost the whole of the limited extent suited for growing crops has been reclaimed by trenching and draining. It is not a profitable speculation, however, to trench such small spots as these. The soil on the arable land, and all low ground, is gravelly, light, but moderately fertile. Since 1870, three new farm-houses and steadings, and nine cottages for shepherds and labourers, have been erected; while, since 1850, several old buildings have been enlarged and renovated. About 35 miles of strong wire fences and three miles of stone dykes have been erected during the last six or seven years, while a good deal of the arable land has been redrained, and the permanent pastures on the river sides well limed. The ordinary five-course shift is followed, and very fair crops of all kinds are grown. The cows generally are strong substantial crosses, while Mr Balfour keeps a good pure shorthorn bull. The extent of arable land is so limited that there is often scarcely sufficient wintering for the cows, and consequently the calves are sold off early in autumn. The calves of last season were sold at the Muir of Ord in September, and were as fine a lot of cross calves as we have ever seen brought into a market in the north of Scotland. There are about a dozen crofters on the estate, and these eke out the produce of their small holdings by employment received from Mr Balfour, and by cartage. There are in all about a dozen sheep-farms, ranging in size from 1000 to 7000 acres. On several of these there are small patches of arable land; but unless the tenant happens to reside on the farm, these plots are not cultivated. Three or four of the sheep farmers, who hold the green hills or richer pastoral lands, keep Cheviot ewes, while the others have blackfaced ewe and wether stocks. A considerable extent of the hill pasture was improved several years ago by surface draining, but a good deal of it is almost as bad as ever. A commencement was made at redraining those wet swampy parts last summer, but the rainfall was too heavy and continuous to admit of much being done. There are about 500 acres of excellent wood—Scotch fir and larch, from 28 to 30 years old. About 400 acres were planted within the last two years, and it has been

arranged that a similar breadth is to be planted during the coming two years. The rental in 1868 was £.2522, now it is £.2834.

The greater part of the parish of Dingwall is taken up by the valuable estate of Tulloch, belonging to Mr Duncan Davidson. The extent is about 2000 acres arable, and 30,000 acres pastoral. During the present proprietor's possession, a great deal has been added to the arable area, while the system of husbandry pursued generally on the estate has been improved immensely. About sixty years ago, the valley of Strathpeffer, formerly a wet swampy marsh, was thoroughly drained and reclaimed, and now it is one of the richest agricultural spots in the county. It has almost all been redrained, and is now quite dry. A considerable portion of the farm of Pitglassie, close to Dingwall, was reclaimed from the sea. The waters of the firth were dyked off by large embankments, and the soil then thoroughly drained. The buildings have been very much improved within the past twenty-five or thirty years. Formerly they were almost all thatched, and anything but commodious; now they are all slated, and have ample accommodation. Very recently a good many additions have been made to farm steadings built some ten or fifteen years ago, chiefly in the way of covered courts. The implements in general use on the estate are of the most modern kind, and every improvement is quickly taken advantage of. Within the past ten or fifteen years a large addition has been made to the cottage accommodation, and now the larger farms are well supplied. The majority of servants are married, and live in these cottages; and there are now very few bothies on the estate. A great deal has lately been done in the way of fencing, and the arable farms are now nearly all enclosed. The policies around Tulloch Castle have been much improved by Mr Davidson, by planting. The scenery in the neighbourhood is picturesque, and close to the castle there is a number of fine old trees. The soil on the higher lying land on the estate is light gravelly loam, while a little lower down it is dark loam, slightly heavier; and on the low land it is chiefly a stiff adhesive clay. The rotation pursued on the best land is the four-course shift—one year's grass, then oats or wheat, then turnips or potatoes, and then wheat or barley sown out with grass seeds. On the very heaviest of the land a few acres of beans are introduced into the turnip break, and invariably they turn out very fairly. The ordinary five-course shift is followed on the lighter land. The yield of wheat averages about $3\frac{1}{2}$ quarters per acre, and weighs about 62 lbs.; barley yields 4 quarters, and weighs 55 lbs.; oats yield $4\frac{1}{2}$ to $5\frac{1}{2}$ quarters, and weigh 42 to 43 lbs. Potato oats often reach 45 lbs. per bushel. The land is specially adapted for turnips, and very heavy crops are usually grown. The turnips are exceptionally rich in feeding properties.

but are deficient in phosphate ingredients, and therefore not calculated to rear big-framed animals. So rich, in fact, are they in fattening compounds, that indiscriminate, or even irregular use to young stock, has frequently been known to cause quarter-ill and kindred diseases. Among the larger farmers, scarcely any cattle are bred. Stirks and two-year olds, chiefly from Caithness, are bought in during the summer months, and fed off from Christmas till April on abundance of turnips and a fair allowance of cake. During the past two years the "soiling" system of feeding has been practised pretty extensively, and is likely to become very popular. Probably more than double the number of cattle fed on the estate twenty years ago is now fattened. The selling prices range from L.25 to L.35. On the crofts a number of very fair cross calves is reared every season. Some of the larger farmers rear three-fourth and half-part bred sheep, and feed off the lambs when yearlings. The general custom, however, on the estate, is to buy in cross lambs for feeding in winter. The arable farms vary in extent from 100 to 500 acres, though a few do not exceed 50 acres. There are also many crofts, varying from 4 to 10 acres; and several labourers' cottages have attached to them about half an acre. These cottages are let at a nominal rent of half-a-crown, with the view to retain in the district an abundant supply of labourers. The town of Dingwall lies into the property, and of course the land immediately adjoining the burgh is turned to good account by dairy farming and the like. The rent of this land varies from L.3 to L.4 per acre. The average for better land throughout the estate is about L.2 per acre, while for crofters' land it is little more than 10s. The rental of the arable land generally has advanced about 20 per cent. since 1850, and that of the pasture land has been nearly doubled.

Part of the Brahan estate lies in the parish of Dingwall, and on this section is situated the fine farm of Humberston, occupied by Mr Aeneas Adam. It extends to about 560 acres, all arable, and is rented partly at L.1 and partly at L.2 per acre. Since 1850 Mr Adam has reclaimed about 120 acres, one-half with the pick and spade, and the other with a plough drawn by oxen. The first half reclaimed was pretty good soil, and was not so difficult to get into crop growing-condition. On the other half the soil was very poor, and a great deal more money was required both to reclaim it by ploughing, draining, and fencing, and to enrich it so as to make it yield crops. The proprietor allowed L.5 per acre for the land thus reclaimed, to be paid at the end of the lease. The new land proved very suitable for growing grass, and is yearly improving in condition. The five-course rotation is followed, and very fine crops of all kinds are grown. Mr Adam now gives nothing to turnips but artificial manures; and

spreads the whole year's dung on lea for wheat, and finds that turnips thrive well in this way. The ground in preparation for turnips receives a good winter furrow, and is afterwards wrought with grubber and harrows. Mr Adam has for a few years sown the artificial manures outside the marker when drilling, and thus the land receives only one drilling. The plants come away quite as well in this way as when twice drilled. From 100 to 200 head of cattle are usually kept on the farm, and nearly all the grass is pastured. Mr Adam rears a good many, and having discovered that the soil is more suitable for the growth of young stock than for feeding, he does not feed on a large scale. A good deal of feeding stuffs is used, however, during winter along with turnips. All the turnips that can be spared along with the outrun are eaten off by sheep taken in for the winter. The horses on this farm, and in the district generally, have been considerably improved of late by the introduction of really good sires from the south, but further improvement is still desirable. The majority of the servants in the district are married, and cottage accommodation is more complete than in most other parts of the north. Rents generally, in the neighbourhood, have risen about 25 per cent. during the past twenty-five years.

In the parish of Fodderty, adjoining Dingwall on the west, lies the beautiful valley of Strathpeffer, the scenery and climate of which are equalled by few spots in the kingdom. The estate of Strathpeffer belonging to the Duchess of Sutherland, Countess of Cromarty, takes up the most of this parish, and stretches down from the foot of Ben Wyvis in the direction of Dingwall. The Duchess also owns the properties of New Tarbat, in the parishes of Kilmuir Easter and Logie Easter, and Coigach, in the parish Loch Broom, and also small patches of land in the parishes of Tain, Kincardine, and Dingwall. For convenience, these estates shall be noticed here. Since 1867 the Duchess' estates have been under the efficient management of Mr William Gunn, and during the past eight or ten years a large amount of money has been expended on improvements of various kinds, such as buildings, fencing, draining, road-making, and planting. Nearly all the farms having been gone over, attention is now being directed to the improving of the dwellings of the many crofters that live on the estates. The system adopted in this work, and which is found to suit very well, is to give an allowance of timber, lime, and glass gratis, and slates at interest, the tenants themselves doing the labour.

The Strathpeffer estate has an arable area of over 2000 acres, 700 acres of wood and young plantations, and 2000 acres of hill pasture, which embraces the south-west side of Ben Wyvis, and which grows pasture of fair quality. The stock of sheep on this pasture is chiefly Cheviots, with a few of the Black-faced breed

on the higher parts of Ben Wyvis. In 1850 the rental was L.2300, now it is L.4960. The valley of Strathpeffer is very fertile, and is well and judiciously farmed by an intelligent and thriving tentantry. There are several farms on this estate varying in their extent from 120 to over 600 acres, while the higher slopes are occupied by a well-to-do class of crofters. The leases of all the farms, both here and at Tarbat, have been renewed within the last ten years, at rents varying from 24s. to 33s. per acre, and in almost every case the proprietrix has been at the expense of enlarging and improving the farm-houses and steadings, all of which are now in excellent order, and fitted up with all the modern requirements. Many miles of wire fencing have also been erected, the tenants executing the carriages for these and the buildings. A well-observed rule on the estate is to hand over every arable farm well and substantially fenced, and with a strong iron gate for each enclosure. The rotation usually observed is the five-course shift, but the tenant, as long as he does justice to the farm, is allowed ample freedom in this respect, providing he leaves the farm in the five-shift rotation at the expiry of his lease. Within the past ten years every farm has been supplied with good slated houses for the farm labourers, each provided with two rooms and a pantry on the ground-floor, and two commodious attics. Within the period stated no fewer than thirty-two of these cottages have been erected. The fine farms of Fodderty and Keppoch have been drained since 1867, the tenants paying interest on the outlay, and performing the carriages. Much attention has been paid to planting on all the Duchess' estates within the past few years, and from 100 to 200 acres are planted annually, chiefly with a mixture of larch and Scotch fir, with a sprinkling of hard-wood trees where the soil and exposure are suitable. About twenty-five years ago a considerable extent of land was reclaimed on the Strathpeffer property, and now it is in eighteen holdings, varying from 7 to 10 acres in extent. The land is of very fair quality, is rented at 22s. per acre, and the occupiers are industrious and thriving. Several miles of hedges (thorn and beech mixed) have been planted within the past ten years, all of which are growing admirably, and contribute much to the well-cared-for appearance that this valley presents.

New Tarbat contains about 2000 acres of arable land, 150 of rough pasture and about 1000 of woods and young plantations. In 1850 the rental was L.1800, now it is L.2750. The soil on one or two of the farms is exceedingly rich, equal to any in Ross-shire, but, generally, speaking the land is light loam overlying gravel. Farms vary in size from 120 acres to 520 acres, and crofts, which are numerous, range from 5 to 40 acres. The home farm is under the careful management of Mr Elliot, and is chiefly

adapted to dairying purposes. Mr Elliot rears his own stock, and always keeps a superior shorthorn bull. The woods are extensive and well managed, and the young plantations are thriving very well. Very little land has been reclaimed on the Tarbat estates for several years, but a good deal has been done in the way of squaring up fields and removing old and useless hedges. The majority of the Tarbat farms have also been recently re-drained on the same terms as the farms of Fodderty and Kepoch.

Coigach is chiefly pastoral, and lies in the parish of Loch Broom, and has a coast line of nearly 40 miles with an area of about 150,000 acres. In 1850 the rental was L.2720, now it is L.4900. Along the coast there is a large population of crofters, who, in addition to allotments of arable land varying from 3 to 20 acres, have in connection with each township a considerable extent of hill pasture, upon which they graze their cattle and sheep. There are several large sheep grazings on this estate, ranging from 5000 to 50,000 acres, but these shall be referred to afterwards. Until within the last few years this extensive Highland property, with its splendid mountain and loch scenery, was almost inaccessible except by sea. But now it is thoroughly opened up, nearly 30 miles of new roads having been constructed by the proprietrix since 1871, at a cost ranging from 2s. to 3s. per yard, or L.176 to L.276 per mile.

To aid the small tenants on her estates in improving the quality of their stock (chiefly Highlanders), the proprietrix gives assistance in the procuring of good bulls. Many of the crofters engage in fishing pursuits, both at home and on the east coast, in the counties of Caithness, Aberdeen, and Banff. It should be mentioned, that a considerable portion of the rise of the rental, both of Coigach and Strathpeffer, is accounted for by the large increase in the rental of shootings.

The large arable farm of Fodderty, and sheep farm of Glen Skeach, both on the Strathpeffer property, are occupied by Messrs Adam and Walter Arras. Fodderty extends to about 500 acres of arable land, and is rented at L.844. The rotation followed is the ordinary five-course shift, and good crops of wheat, barley, oats, and turnips are grown. The turnip land gets a heavy dose of farm-yard manure, and a liberal allowance of artificial stuffs, chiefly dissolved bones and superphosphates, and from 1 to 1½ cwt. of nitrate of soda. About 2 cwt. of this latter stimulant was tried one year, but found not to have a very beneficial effect. On the mossy land on the level part of the farm grain crops are very apt to lodge; and to prevent loss in this way, beans are sometimes sown along with oats. No cattle are bred on the farm, but a good many are bought in and fed off for the spring markets, when they realise from L.22 to

L.31. A stock of about 700 Cheviot ewes is kept on Glen Skiach; and the wether lambs are brought down to Fodderty about the 12th of August, and sold fat when about twenty-two months old. Fodderty is worked sometimes with five and sometimes with six pairs of horses, and is, probably, one of the best managed farms in the district.

On the estate of Foulis, in the neighbouring parish of Kiltearn, belonging to Mr Charles Munro, various improvements have recently been effected, and the rental during the past eight or ten years has increased from L.3200 to L.4083. The valuable little estate of Swordale, the property of Mr W. Munro, has also been very largely improved.

The estate of Culcairn, belonging to Mr H. A. M. Butler Johnston, M.P., and the Novar property, both in the parish of Alness, have been improved in various ways by reclaiming, draining, building, fencing, and the like, since 1850, the rental of the latter having increased since 1868 from L.2413 to L3124. Mr S. C. Munro's well-farmed little estate of Teaninich has also been slightly improved of late, and the rental has increased from L.1200 to L.1590 during the past eight or ten years. On the Novar and other properties in the parish of Alness a great breadth of land has been planted, chiefly with larch and Scotch fir, within the past thirty or forty years, and now the extent of wood in the district is very considerable.

Easter Ross.

This division is the most important in the county, and is indeed one of the finest agricultural districts in Scotland. Leaving Mid Ross, we enter Easter Ross, in the parish of Rosskeen, and at once reach the scene of, perhaps, as extensive improvements as have ever been attempted in this country by a single proprietor. The honour of these undertakings belongs to Mr Alexander Matheson, the respected Member of Parliament for the county. This gentleman retired from the bustle of the commercial world several years ago, and returning to his native county, devoted himself to the promotion of the higher interests of agriculture. With this view he, between 1840 and 1861, acquired possession of several large estates in the county; and some idea of the extent of his property can be got from the fact that his gross annual rental is close on L.22,000. His more valuable possessions lie on the east coast, and were purchased from the Duke of Sutherland, Mr Ross of Pitcaulnie, Mr Munro of Lealty, Colonel Ross of Cromarty, Mr Macleod of Cadboll, and Mr Ogilvie of Corrimony. His possessions on the west coast were purchased from Mr Mackinnon of Ardintoul, Mr Mackenzie of Inverinate, Mrs Lillingstone of Lochalsh, Colonel McBurnet of Attalade, Sir James Mathieson of the Lewis, and

Mr Tennant of Auchnashellach. The entire combined property is generally known as the Ardross estates, though it may be mentioned that the original Ardross is on the east coast, in the parish of Rosskeen. The original Ardross was bought in 1846 from the Duke of Sutherland, and along with the other smaller properties acquired in the neighbourhood, has been the centre of the principal improvements by Mr Matheson.

In 1858 Mr William Mackenzie, factor on the estates, under whose able management the improvements have been carried out, reported to the Highland and Agricultural Society what had been done at Ardross up till that time; but, notwithstanding, it would perhaps be as well to give a general *resumé* of the improvements from their very commencement. We shall first, however, contrast the Ardross of 1846 with the Ardross of 1876, and then attempt to describe the elaborate improvements that led up to the present result. When Mr Matheson obtained possession of these estates the land was held principally by small tenants, whose arable areas varied from 6 to 20 acres. The houses were small and uncomfortable, the stock kept was of inferior quality, and the general system of cultivation was of a very primitive order. The configuration of the land was rough, stony, and uneven, and not at all inviting for cultivation. Now Ardross is a picturesque, rich-looking, fertile agricultural district, laid out in moderately sized farms and crofts, well fenced, well arranged, with handsome commodious houses, and bearing profitable crops of all kinds. In all, about 4000 acres have been reclaimed from waste land, by draining, trenching, liming, &c. This land is situated along the north side of Alness river, and stretches back from Cromarty Firth, a distance of ten miles, to the top of Strathrusdale, and embraces the off-shooting valleys of Auchnaclloch and Strathy. The elevation varies from 50 feet to 900 feet above the level of the sea. The first step in the improvements was a thorough survey of the whole land, and the drafting of a plan to guide the operations. New farms for the old tenants were laid out, the boundaries of plantations were traced out and lined off, the positions of farm offices were indicated, the sizes and forms of fields were decided upon, and the courses of all the principal leading drains were staked off on the ground (*vide* Mr Mackenzie's Report in "Highland and Agricultural Transactions" for 1858). These preliminaries over, the real work of reclamation was begun. The supply of native labour being wholly inadequate for the work, men were procured from other districts, and housed in a large and commodious barracks built for the purpose. About 200 men lived in these barracks during the whole period of the improvements, and this system was found to work very satisfactorily. In addition to these 200 labourers, about 100 of the residenters were usually employed at

the works. First of all, a broad service road, 10 miles in length, was run right back through the centre of the land to facilitate operations; and as the work proceeded, about other 40 miles of accommodation roads were constructed. The roughness of the land made ploughing impossible, and therefore the first turning-over had to be done by the pick and spade. The land having been thus trenched, drains were then cut, and the stones up-turned in the trenching were utilised in the drains. The leading drains were all made in the natural hollows of the ground, however winding these might be, and in this way a cutting of 3 feet in most of the hollows was equal to 5 or 6 feet of depth on either side. Immediately behind the trenchers companies cleared off the surplus stones, and this necessitated blasting on an extensive scale. The stones were carried to the edges of the fields, and used in the building of dykes, an operation that went on simultaneously with the other improvements. Building was also begun very early, and thus trenching, draining, stone-clearing, dyking, road-making, and house-buildings were all proceeding apace. In his report Mr Mackenzie says—"To a casual observer, when the works were in progress, the expenditure might appear profuse, and perhaps reckless. Instead, however, of this being the case, the works were executed upon the principles of strictest economy. In the apparent confusion of trenchers, drainers, dykers, blasters, masons, carpenters, &c., there was the most perfect order; and the carrying out of a design, although each operation was separate in itself, still all of them were yoked in heartiest co-operation; and to this feature of the works must be largely attributed their success as a whole." The works were almost all executed under small contracts, the labourers having been divided into small contracting companies, ranging from two to twelve in number. But Mr Mackenzie has described the *modus operandi* so fully in his excellent report, that anything more than a general sketch of what has been done would be out of place here. True, the Ardross improvements were little more than half completed in 1858, but the lines laid down at the very commencement, and detailed so clearly by Mr Mackenzie, have been strictly adhered to all along.

The draining of a large flat of swampy boggy land on the estate of Delny, one of the little properties attached to Ardross, was so difficult and so interesting an undertaking that a short notice of the method adopted might be acceptable. The greater part of the flat was at one time a common among five surrounding proprietors, the tenants of whom cut their peats from this common up, in fact, till it was acquired by Mr Matheson. The Burn of Delny, which has its source in the valley of Strathy, near Strathroy, and passes through the loch of Achnacloich, at one time winded in a circuitous course through this boggy flat, frequently

overflowing and covering the whole of it with water. In its dry state the pasture caused black cattle to turn grey in the course of one season, so poisonous was the stunted herbage the land produced. The soil consisted of the lower stratum of peaty bog and marsh and spirity sand, charged with noxious ochrey-coloured water impregnated with sulphur and saltpetre. Former occupants frequently attempted to drain the flat, but all their efforts were fruitless, in consequence of want of proper outfall. In 1868, shortly after he acquired the property, Mr Matheson began the draining of this flat in thorough earnest. The first step was the securing of proper outfall for the waters, and for this purpose a large stone-built 2-foot square drain was run from the sea west of Ballintraid farm-house right back into the flat, while a main leading drain laid with "spigot and faucet" vitrified pipes 10 to 15 inches in diameter, and jointed with cement, was continued for about 800 yards through the flat, the depth in some places reaching 8 feet. To relieve this main drain, part of the drainage was directed to the old mill-dam of Delny and part also towards Polo. The land drained by these three outfalls extends to about 800 acres. The subsoil of the whole flat is running sand, and was so much charged with running water that in cutting the drains for the main leading pipes, the sides had to be supported with a framing of wood, and at the bottom of the drain no more than the length of one pipe could be excavated at a time. Each successive pipe was carefully laid in and jointed with cement as its bed was cut out; and to prevent the sand getting in, a board was placed at the outer end. At the time the main drains were cut, the 2-foot square stone drain and the 15-inch pipes were fully required to carry off the water led into them, and the water was so charged with noxious elements, such as iron, sulphur, saltpetre, &c., as to form incrustations on the bars of the iron gratings on the air-shaft so hard that considerable force was required to break them off. The silt in the bottom of the pipes had also to be cleaned out at intervals during the first two years. From these main drains a complete network of minor drains, ranging from $3\frac{1}{2}$ to 4 feet deep, laid with tiles from 2 to 4 inch bore, stretches out in all directions. Here and there along the leading drains ventilating shafts with iron gratings were built to admit circulation of air, while at two or three points, where the larger collections of drainage enter the principal drains, large stone cisterns were built for the purpose of receiving the silt. These cisterns are from 8 to 10 feet deep, or from 2 to 3 feet deeper than the drains, and thus there is a space for a considerable deposit of the sedimentary matter brought in by the incoming drain. The mouth of the outrunning drain is covered with an iron grating, and by attending carefully to the cleaning out of the cisterns, very little silt can get into the main

drains, This bog is now so thoroughly drained, and the land so consolidated, that a 6-inch pipe is sufficient to carry the water; and the noxious substances with which the water used to be impregnated have entirely disappeared. The land, too, yields excellent crops both of cereals and of turnips. Indeed, the tenant of Ballintraid informed us that he had this year upwards of 4 quarters of oats per acre from what used to be the most swampy part of the bog. Mr Mackenzie was also sole engineer of this important draining undertaking, and the complete success that has followed his efforts must be very gratifying both to himself and his employer.

Mr Mackenzie gives details of the cost of reclaiming one of the first improved sections of the property, and also indicates the system adopted in bringing the new land into proper crop-growing condition. On this section, which extended to about 160 acres, and which was divided into fields, the average cost per acre of trenching was L.8, 13s. 0 $\frac{3}{4}$ d.; draining, L.6, 10s. 10d.; blasting, L.5, 2s. 0 $\frac{1}{2}$ d.; clearing off the stones, L.2, 8s. 3 $\frac{3}{4}$ d.—total average per acre, L.22, 14s. 3d. The cost of all these works of course increased considerably before the improvements were wholly finished, owing to the general increase of labourers' wages throughout the country, but these figures give a pretty correct idea of the real cost of the Ardrross improvements. The more recently reclaimed lands cost about L.24 per acre. On the section referred to, the whole of the fields, with one exception, were limed according to the texture of the soil with from 14 to 20 bolls per acre; manured with composts of barrack sewage and moss and vegetable matter taken out of drained ponds, and Peruvian guano; and sown, some with wheat, others with oats, and one with turnips. The yield was very good indeed in every case excepting one field, which was not limed for two years after being reclaimed, and on which the yield of oats was nearly 2 quarters per acre behind the average of the other fields. Wheat averaged about 5 quarters per acre, and weighed 64 lbs.; oats about 6 quarters, and weighed 44 lbs. The turnip crop was an average one, and having been eaten off by sheep, was followed by an excellent crop of oats sown out with grasses for permanent pasture. Two of the fields, one sown with wheat and another with oats, were at once sown out into permanent pasture, while on two or three of the others turnips, manured with farm-yard manure and guano, and then oats or wheat with seeds for permanent pasture followed the first grain crop. The permanent grass came away very well every season, and for several years the parks were let at an average of about L.3, 10s. per acre. The system of "breaking in" thus briefly indicated has been followed very generally all along, though in late years two or three slight variations were introduced.

How, it may now be asked, have these 4000 acres of reclaimed land been apportioned? To begin with, upwards of 1200 acres are held in the proprietor's own hands. Of these 800 acres are worked under a five-course rotation in the farms of Mains of Ardross and Easter Ardross. The remaining 400 acres are laid down under permanent pasture, and of these 300 acres form part of the pleasure grounds around Ardross Castle, which grounds extend altogether to about 700 acres under wood and permanent pasture. The castle, which was erected by Mr Matheson, is situated upon the north bank of the river Alness, at an elevation of 500 feet above the level of the sea, and about five miles distant therefrom. The castle itself is a very handsome edifice; and the situation, now that the grounds are in thorough trim, is indeed charming. The river Alness runs close by, and is in full view from the castle windows. The laying down of the permanent pasture was considered very carefully by Mr Mackenzie, and the course pursued is worthy of more than a mere general notice. Where the soil was thin and moorish, the seeds were sown broadcast with rape seed (without a grain crop), at the rate of 12 lbs. to the acre, the trenched land having been well harrowed and broken, and top-dressed with 1 cwt. of superphosphate and 2 cwt. of bone meal to the acre. In the months of August and September sheep were put on to crop the rape and grass, and early in winter the land was ploughed so as to get the soil exposed to the action of the weather and thoroughly pulverised. Next year a crop of oats was grown, and immediately after harvest the land was again ploughed. In the following spring it was thoroughly grubbed with rank toothed harrows and sown with the following mixture:—

1½ lbs. Meadow Foxtail,	3 lbs. Hudson's Bay Meadow Hay
½ „ Sweet Vernal,	Grass,
2 „ Common Rough Cocksfoot,	2 „ Rough - Stalked Meadow
3 „ Hard Fescue,	Grass,
1 „ Sheep Fescue,	1 „ Major Trefoil.
3 „ Meadow Fescue,	2 „ Alsylke,
6 „ Italian Rye-Grass,	2 „ White Clover,
14 „ Ayrshire Evergreen Rye-Grass,	4 „ Cow Grass, and
2 „ Timothy,	8 „ Rape,
	55 lbs.

The land was top-dressed with 1 cwt. nitrate of soda, 1 cwt. of dissolved bones, and 3 cwt. of bone meal to the acre. All the covering the seed got was a careful rolling with the Cambridge roller, and thus all the seed came up regularly. About the beginning of August the ground was ready for sheep, but care was taken lest the sheep should make it too bare. They were allowed to crop only so as to secure a good sole. In September following the land was again heavily rolled with the view of

preventing the plants from being thrown out by the action of the frost. It is now twenty-three years since the piece of land these remarks refer to was laid down as permanent pasture, and since then it has not been broken up. But thirteen, ten, and nine years ago it was re-sown with the same mixture of seeds as at first, with the exception of rape, cowgrass, timothy, and trefoil, and top-dressed with 1 cwt. nitrate of soda, 1 cwt. superphosphate, and 3 cwt. bone meal, and afterwards rolled about the end of April. Before being re-sown the land was gone over with heavy iron harrows to loosen and tear up the fog with which the ground had become overrun, especially the poorer soils. The fact of the land having been under sheep made it run much more quickly to fog than if it had been grazed by cattle and horses. By the above method, however, the pasture was renewed at less expense and more satisfactorily than if had been broken up and put through another complete rotation, which would have necessitated a lapse of six years before the pasture would have reached its previous richness. And besides this, the breaking up of the land would have created an eyesore in the pleasure grounds. The other portions of the ground which were of a better quality were first cropped with turnips, laid down with a compost of pulverised earth and lime in proportion of a cubic yard of peat earth to 6 cwt. of English lime, mixed together several months before being used. Of this mixture 28 loads were given to the acre, along with 1 cwt. Peruvian guano, 2 cwt. bone meal, and 2 cwt. of the best dissolved bones. The turnips were eaten off by sheep, and in spring oats were sown which yielded at the rate of 6 quarters to the acre with a heavy crop of straw. After harvest the land was ploughed, and in spring grubbed and harrowed, and in May sown with grass seeds of the same variety and quantity as already mentioned, mixed with a bushel of barley to the acre, for the purpose of sheltering the plants while young. At the sowing of the seed the land was top-dressed with 3 cwt. bone meal, 1 cwt. Peruvian guano, and 2 cwt. best superphosphate of lime. The grasses came away so rapidly that sheep were pastured on the land about the end of July. Since first sown out, the better land was treated in the same way as the lighter soils. For several years back cattle have grazed upon these permanent pasture lands from the beginning of July till the middle of September, which has greatly improved the grasses as wintering for sheep, and has destroyed the fog and strong tufts of natural grasses which sheep do not eat. Old as the pasture now is, it still continues good, but the poorer parts and the portions most overrun with fog will be re-sown and top-dressed as formerly.

The portion of the reclaimed land not included in what Mr Matheson holds in his own hands was laid out in carefully

graded crofts and farms, the latter ranging from 30 to 300 acres, and the former from 5 to 20 acres. The advantages of gradation were fully recognised by Mr Matheson, and in this respect his property is a perfect model. The new farms and crofts were all laid out according to a pre-arranged plan, and before being handed over to the tenants were fully supplied with roads, fences, and houses. As already stated, about 50 miles of private roads were made; and in enclosing and subdividing farms and crofts, $92\frac{3}{4}$ miles of stone dykes and $62\frac{1}{2}$ miles of wire fences were erected. The stone dykes are $5\frac{1}{2}$ feet high, exclusive of the cope, above the surface of the ground. There are three courses of through bands in the height of the dyke, 6 feet apart, and bedded in lime. The cope is also bedded in and pointed with lime, while all the dykes along the roads, and the most of those forming divisions between farms, are harled on both sides with lime. The wire fences are from 3 feet 10 inches high with 6 wires to 4 feet high with 7 wires. According to the position and the required strength of the fences the wires are from No. 2 to No. 6 of bright wire, galvanised wire, and galvanised strand wire. The wire fences along roads have iron standards $1\frac{1}{2}$ inch by $\frac{3}{8}$ of an inch 6 feet apart, and the subdividing fences have posts of larch from 6 to 7 feet apart, with the bark taken off. The extreme straining pillars are $1\frac{1}{2}$ inch square with double stays, and at every 80 yards there are intermediate straining pillars of the same size. The whole of the wire fences are painted with Carson's anti-corrosive paint, which, on account of its durability and cheapness, is also used extensively in painting outside wood-work of buildings and farm implements.

In addition to the 4000 acres reclaimed, a considerable extent of old land was drained and remodelled and fenced, and now there are upwards of 5000 acres under cultivation on the Ardross east coast estates. There are in all 27 farms, paying from L.50 to L.800 of rent, and on the majority of these complete new steadings and dwelling-houses have been erected by Mr Matheson, while most of the others have been repaired and extended. The farm steadings are all furnished with thrashing-mills, some being driven by steam, some by horses, and others by water. The dwelling houses as a rule are handsome and commodious. The crofters' dwellings and office houses are neat and convenient. A large number of labourers' cottages have been erected of late, and now the supply of these cottages on the Ardross estates is complete. The number of resident labourers is quite sufficient for all the works on the estates, and care is being taken that this shall continue so. The farms were all subdivided to suit the five-shift rotation, and almost without exception this course of cropping is adhered to. The soil, generally speaking, consists of heavy brown loam lying on a clayey subsoil, and is found to pro-

duce very good crops of both cereals and green crops. Almost the whole of the arable land has a pleasant southern exposure. The average rent of the new land is 21s. per acre, and of the old land which has been remodelled, from 28s. to 40s. per acre. The first nineteen years' lease on most of the new farms will expire within a year or two, and the farms have all been re-let to the old tenants at a slight increase of rent. The estate regulations under which these farms are let are carefully drawn out printed documents—much superior to the ancient written lawyer leases. The clause bearing on improvement is as follows:—“The tenants will be allowed on interest lime, at the ship's side, in such quantity as may be considered necessary for their lands, and a sum per acre as may be agreed upon for trenching, draining, and otherwise improving their lands. They will also be allowed on interest, iron wire, and cost of erection of fences for closing and subdividing their farms where stones cannot be obtained. All the above interest to be at the rate of 5 per cent. per annum, payable along with the rent. The tenants will be allowed, free of charge, tiles for draining where stones cannot conveniently be got, wood for intermediate standards for wire fencing, and timber, and lime for such additions as may be considered necessary for the accommodation of their farms erected to a plan approved of by the proprietor, such fences and buildings to be left in a tenantable state of repair at the end of the lease.”

Before leaving Mr Matheson's east coast estates, we may briefly refer to the extensive and important improvements he has carried out on his west coast properties at Strathcarron in the parish of Lochcarron, at Strathbran in the parish of Contin, at Ardintoul in the parish of Glenshiel, at Inverinate in the parish of Kintail, at Balmacara, and Duncraig. At Duncraig a very handsome new mansion has been erected since 1866, and furnished and fitted up with all the modern appliances. New gardens have also been made here, the site chosen being a narrow gully between two high ridges of rock. The rock was cut away on both sides, and a level upwards of two acres in extent having been formed, soil composed of virgin soil and turfy loam, from a loch near by, was spread at considerable depth on the level, and thus a very rich fertile garden was formed, where before there was nothing but bare rock. The scenery around Duncraig is really magnificent, and the landscape immediately in front of the mansion very picturesque. The grounds are formed of wooded knolls and grassy valleys, which have been improved and tastefully laid out under permanent pasture, and the blending of rock, wood, and waving grass is pleasant in the extreme. About 12 miles of private drives and walks were formed around Duncraig, and in some cases these had to be cut out of the solid rock. At one or two points, in fact, the road had to be formed in the face

of a rocky precipice, rising more than 100 feet sheer up from the sea. It is intended to form a home farm at Achindarroch, about a mile south of Duncraig, and there some 200 acres of land have been reclaimed. Operations were begun here about eight years ago, and have proceeded quietly and steadily since then. Roads had first to be formed, and then draining, trenching, &c., and stone clearing followed. The land in its natural state was dreadfully rough and quite full of stones, and before it was ready for the first crop it necessitated an outlay of from L.25 to L.30 per acre. Rape, top-dressed with from 4 to 8 cwt. of bone meal, was grown as a first crop, and this having been eaten off by sheep, the land was ploughed and sown with oats. Turnips and potatoes followed next year, and then the land was sown out with oats and grass seeds, and allowed to lie under grass for a few years. The crop in every case was excellent, and there is every prospect of the new land becoming very rich and productive. The original value of the land reclaimed from moor and moss was very little over 1s. or 1s. 6d. per acre, and now it is worth from 30s. to L.2 per acre. A few small patches of these 200 acres have been in cultivation for many years, but when it is mentioned that the whole, along with a very large outrun, was leased, previous to 1868, by two tenants at a gross rent of L.40, it will be imagined that it was not in a very fertile condition. A barn, about 30 long by 10 feet wide, afforded ample storage room for the whole year's crop! Ten dairy cows, twelve Highland cows, and the carriage and riding horses, are kept at Achindarroch, while Mr Matheson's Cheviot hogs are wintered here. His stock of sheep numbers about 1700 Cheviot ewes. A great many crofters are situated along the coast in this neighbourhood, and, by encouragement from Mr Matheson, almost all of them have considerably improved their holdings.

At Balmacara 50 acres have been reclaimed, within the past five years, from hill, moor, and moss. The land here has a southern exposure, looking right into the Isle of Skye, and the soil is sharp and fertile. The subject here was not nearly so rough as at Achindarroch, and the cost of reclamation was considerably less. The land was first drained, then ploughed with a heavy plough drawn by three horses, and cleared of stones and prepared for cropping in the usual way. Oats generally yield from $3\frac{1}{2}$ to 5 quarters per acre, and weigh about 42 lbs., while turnips and potatoes grow well. Barley has been tried, but for this variety of grain there is too much rain and too little sunshine all along the west coast. A great many new houses have been built on the west coast properties within the past twenty-one years; and for some years back the whole rental of these estates, and sometimes a good deal more, has been expended upon them in improvements of various kinds.

At Inverinate, on the shores of Loch Duich, Mr Matheson

really began his west coast improvements about 1847. A fine mansion-house was built, and surrounded by tastefully laid out gardens and grounds, the greater part of which was reclaimed from the sea; and, in addition to all this, close on 300 acres of land were either reclaimed or remodelled and improved. Inverinate Lodge is let to a sporting tenant, and a new lodge, recently built at Dorrissduan, is also occupied by a sportsman.

At Strathcarron about 200 acres of land have been reclaimed and a good many crofters' cottages built, concrete having been used in consequence of stones being difficult to procure. Arrangements have been made for the building of other eight concrete cottages; and here, as well as at Strome Ferry and Balmacara, a commodious hotel has been built. The arable land at Strathcarron is taken up principally by "Club Farms," of which there are no fewer than seventeen on Mr Matheson's estates. This "club" system is an excellent one. A tract of say 50 or 60 acres of arable land is occupied by four or five tenants, each having his own separate croft, and attached to these 50 or 60 acres is a large outrun, upon which a "common" flock of sheep is kept. The flock is not composed of so many belonging to one tenant, and so many to another, as in the case of the ancient commonty system, but is the joint property of these four or five tenants. Two of the tenants are appointed annually to buy in the sheep, manage them on the pasture, and sell them off at the appointed time. A balance is struck every year, and the proceeds are divided equally among the tenants. Each club farm has its own mark for its flock, which, in fact, is managed in every way as if it belonged to one man. Of the seventeen club farms on Mr Matheson's estates three are on the east coast and fourteen on the west coast. The total number of tenants on these farms is 101, the number in a club ranging from two to ten. The total sheep stock is about 8000, and the arable area about 900 acres. Blackfaced sheep principally are kept on these farms.

In addition to all these gigantic agricultural improvements, Mr Matheson has done a great deal in the way of planting. On the east coast estates he has planted 5000 acres, divided into 56 plantations and 43 clumps; on the west coast properties he has planted 1500 acres, divided into 21 plantations and 12 clumps; and thus he has planted in all 6500 acres, every acre of which is substantially enclosed.

It is worthy of remark that among the first steps taken towards improvement at Ardross was the establishing of a school in the district. The school stands at the roadside, not far from the castle, and is now attended by about 140 pupils. The whole population of the district, in 1847, was only 109. Great as the land improvements have been they are not yet finished. At Ardross there are at present two farms—Baldoon and Cramich—in course of improvement, and it is in contemplation to form a

new farm at Stittenham. On the west coast the improvement of the estate of Attadale is contemplated. This estate is at present in the hands of one tenant, but it is intended to divide the estate into four farms with new steadings and dwellings, and also make a considerable addition to the arable land. The improvements of the farms of Fernaig, Achmore, and Braeintrah is also contemplated. We have devoted a good deal of space to Mr Matheson's many and various improvements, but when it is mentioned that, in round numbers, they entailed an outlay of something like L.150,000, it will be admitted they fully merit the notice they have got.

One of the principal holdings on the Ardrross estates is the farm of Dalmore, occupied by Mr Andrew Mackenzie, son of the respected factor on the property. The extent is about 370 acres arable and 50 in pasture. The soil is light, but kindly, and has curious veins of gravel running through it all over the farm. The usual five-course rotation is followed, the best land being sown with wheat, the medium soils with barley, and the lighter gravelly parts with rye. With the view of obtaining a good supply of straw, as much wheat as possible is grown, and the favourite varieties are Chedham and Hunter or Essex white wheat. The seed is changed every three years, generally from the south of England, and from 3 to 4 bushels are given to the acre. The yield varies from $3\frac{1}{4}$ to 4 quarters per acre, and the weight from 60 to 62 lbs. per bushel. The favourite variety of barley is Hallet's Pedigree Barley. The barley seed is also changed every three years, and about 3 bushels of seed are allowed to each acre. The Pedigree variety grows more straw than the ordinary chevalier variety, and for this reason is used the most extensively. The yield averages about 5 quarters per acre, and the weight ranges from 54 to 56 lbs. per bushel. The Sandy variety of oats stands supreme in Ross-shire. It usually affords a heavy yield of straw, and where so much attention is paid to feeding, the crop of straw is a very important consideration. Mr Mackenzie grows no oats but the Sandy variety, and usually reaps from 4 to 5 quarters from each acre, the weight ranging from 40 to 42 lbs. per bushel. About 4 bushels of oats are allowed to an acre as seed. Rye grows very well on the thin gravelly land, and is on the whole a remunerative crop, considering that it will grow well where no other variety of grain would come away at all. It affords a fair crop of straw, which is valuable for thatching purposes, and usually yields from 3 to $3\frac{1}{2}$ quarters per acre, and weighs from 56 to 60 lbs. per bushel. The land intended for turnips is subsoiled early in autumn by a steam tackle, the "knifer" or subsoiling plough being always used. The object of this is to stir up and loosen the land to a greater depth than it had hitherto been. The knives of the plough penetrate to a depth of about 18 inches, and give the

soil a most thorough stirring. The plough takes a breadth of 3 feet at a time, and from 4 to 5 acres can be gone over in a day. The total cost is about 30s. per acre, but high as this may seem, the system has been found to be a most profitable one. A great many stones never before touched by the plough have been taken to the surface by the knifer, the smaller ones being used in "boxing" service roads. Immediately after this stirring the land is cross ploughed by a pair of horses to a depth of from 10 to 12 inches. In this condition the land lies till early in spring, when it is grubbed and harrowed and cleaned in the ordinary way. The weeds are carted into a heap and soaked with liquid manure, and after being allowed to lie in this state for several years, the compost is used as top-dressing. The farm manure is carted out into the field on which it is to be used during the leisure hours of winter, and in this way time is economised in spring. Turnip-sowing commences about the 18th of May, and about a week previous to that the manure heaps are saturated with liquid manure, which is poured into trenches dug across the midden to the depth of about 2 feet and about 2 feet apart. About three-fourths of the turnip break is put under swedes, the other fourth being sown with yellows and white varieties for early use. For swedes the land is manured with from 30 to 35 loads of farm-yard manure and 2 cwt. of bone dust, 2 cwt. bone meal, 1 cwt. of guano, and 1 cwt. of superphosphate per acre; and for other varieties the dose is lessened a little. Mr Mackenzie is this year experimenting upon the action of nitrate of soda. On one plot he added 1 cwt. of nitrate of soda to the mixture of artificial manure, on another $\frac{1}{2}$ cwt., and on another $\frac{1}{4}$ cwt., and on the remainder of the field no nitrate of soda has been sown. The effect of these special applications has not as yet been ascertained, as the crop at the date of this report was still on the field, but the result of the experiment will be of considerable interest.* The drills are about 28 inches wide, and from 10 to 12 inches deep. Turnips of all kinds usually grow very well, and afford a yield of from 24 to 30 tons per acre. It will be seen that a very large percentage of the mixture of artificial manure consists of bones in various forms, and the object of this is to favour the growth of grass in after years. Potatoes are grown only for home consumption. Almost all the first year's grass is retained and cut as hay, not a hoof being allowed to enter the field from the time the grain is removed till the gathering of the hay. At one time the stubble

* The turnips (Swedes), grown on each plot were weighed in the last week of November, and, though the difference did not exceed a few pounds, the greatest weight was reached by the roots grown without any nitrate of soda. The conclusion come to, is that nitrate of soda is thrown away when applied to a turnip crop on light land, such as that on which this experiment was conducted. The turnips of each plot were stored separately, with the view of testing their keeping qualities; and having been examined the other day about the middle of February, were found to be all equally good.

land was overrun by sheep in autumn, but Mr Mackenzie observed that in this way a great many of the roots of the young grasses were torn out and destroyed from all further vegetation, and now the land sown out with grasses in spring is kept clear of all kinds of stock till after the cutting of the hay. About the first week of April the young grass is top-dressed with 1 cwt. of nitrate of soda and 1 cwt. of dissolved bones per acre, and about the beginning of July the hay is cut with a mower, first put into "coles," and then stacked. The crop of hay generally averages about 180 stones to the acre, and is invariably of the finest quality. The aftermath is utilised in feeding sheep. Mr Mackenzie keeps from eight to ten cows, and breeds from these and a shorthorn bull, the present stock bull being Neagle, bred by Mr W. S. Marr, Uppermill, Aberdeenshire, and after Royal Prince, Mr Marr's well-known K.C.B. bull. The extent to which feeding is carried on at Dalmore is really wonderful, but this shall be noticed at greater length further on. About the end of September or beginning of October Mr Mackenzie buys in from 250 to 300 Cheviot wethers and about 200 cast Cheviot ewes. The ewes are fed on cut turnips and about 1 lb. per day of the feeding mixture; and the wethers get turnips on the root, along with hay draff and 1 lb. per day of the mixture. They are sold off generally in January or February. A very large number of swine are also fed off every year, the variety kept being Duckering's improved breed.

Reference has also been made to the farm of Balintraid, on the property of Delny, which Mr Matheson acquired. This large and highly-cultivated farm is tenanted by Mr Andrew Monro, banker, Invergordon, and is rented at L.766. Mr Monro is an enthusiastic liberal farmer, and besides cultivating his farm on the most approved principles, feeds a large number of bought-in cattle during winter. He owns extensive manure-works at Invergordon, and from these and the well-known establishment of a similar kind at Bunchrew, owned by Messrs John Cran & Co., more than two-thirds of the whole of the artificial manure used in the counties of Ross and Cromarty are obtained.

On Mr Roderick Mackenzie's desirable little estate of Kin-craig, in the parish of Rosskeen, is situated the fine farm of Tomich, occupied, along with the adjoining small farm of Broomhill, by Mr John Hall. Mr Hall has for many years been well known as an experienced valuator of land, and thoroughly practical, intelligent agriculturalist; and both with respect to cultivation and general arrangements, his farm is indeed a perfect model. Tomich extends to about 400 acres, all arable, is worked in seven shifts; and Broomhill, measuring 150 arable acres, in five shifts. The land intended for turnips is subsoiled in autumn, cross ploughed in spring, and well cleaned, and dunged with from 20 to 25 loads of farm-yard manure, and 7 cwt. of bone

meal, dissolved bones, and bone ash, and 1 cwt. of Peruvian guano per acre. Of swedes about 3 lbs. of seed are given to the acre, and of yellows about 2 lbs. Swedes usually yield 25 to 27 tons per acre. About one-half of the yellows and one-third of the swedes are eaten off by sheep, the greater portion of the turnips being cut and given to the sheep in boxes, instead of being left to be eaten on the root. Mr Hall usually plants about 30 acres with potatoes, and for this crop he prepares the land much in the same way as for turnips. About the same quantity of farm-yard manure is given for potatoes as for turnips, and for the former the following mixture of artificial manure is allowed to each acre, viz., 1 cwt. Peruvian guano, 1 cwt. potash, 1 cwt. dissolved bones, and 4 cwt. bone meal. The favourite varieties are Rocks and Regents, and the yield usually varies from 5 to 7 tons per acre. Potatoes are planted as early as possible in March. Wheat on an average yields about 4 quarters per acre, and weighs from 60 to 62 lbs. per bushel; barley from 4 to 4½ quarters, and weighs about 54 lbs.; and oats from 4 to 5 quarters, and weigh from 40 to 43 lbs. The varieties most used are White Hunter and Fenton wheat, Chevalier barley, and Sandy oats. Mr Hall keeps six cows to supply the farm with milk, and in the months of April and May he buys in about 120 two-year olds, which he feeds for the Christmas and January markets. In addition to an abundant supply of turnips and hay, a liberal feed of cake and corn—a mixture of oats and rye—is given all along, beginning with 3 lbs. a day, and increasing gradually till from 8 to 10 lbs. per day are reached during the last month. These 120 animals generally average about L.30 in the beef markets; and in addition to these Mr Hall winters about 30 six-quarter olds and about 20 calves. He also buys in 200 half-bred ewes, and by these about 300 lambs are usually reared. Both the young stock and the old are fed off on turnips, hay, and cake during winter, and sold partly at Christmas and partly in spring. Besides these, about 300 Cheviot wethers are invariably bought in, and fed chiefly on turnips taken on other farms. These also get a little cake and hay along with the turnips, and are sold off in January and February. Mr Hall has been twenty-five years at Tomich, and during that time he has drained the whole of it, some of twice over, in fact, at his own expense; and in the way of fencing he has done a good deal. He has also improved the farm steading, and built a very handsome dwelling-house, all at his own expense; and in many other ways he has greatly improved the farm. There are eight or nine cottages on the farm, and the servants employed are mostly married.

Invergordon Castle and four or five very fine farms in the neighbourhood belong to Mr R. B. Æ. Macleod of Cadboll, whose very valuable and carefully managed estates lie in the

parishes of Rosskeen, Fearn, Tarbat, and Tain. The Cadboll property extends to 12,000 acres, all arable, with the exception of 1500 acres chiefly in the lands of Fendorn, in the parish of Tain. The total rental of the property, which contains several of the finest farms in Ross-shire, is L.11,568, the increase during the past twenty-five years in the acreage rental being about 25 per cent. Since about 1850, 1000 acres of woodland and rough pasture have been reclaimed and converted into arable land of fair quality, worth from 15s. to 25s. per acre. A large portion of the reclaimed land was trenched to a depth of 14 inches, at a cost of about L.12 per acre; and the remainder was ploughed with a substantial implement. The soil generally in the property is light, sharp land, either on boulder clay, gravel, or the Old Red Sandstone. The quality varies a good deal throughout the property, and in some parts the rent per acre is only 15s., while in others it reaches L.2. The rotation generally followed is the five-course shift, with two years' grass. Few cattle are bred, but a large number of crosses are bought in and fed for the winter and spring markets. The farms vary in extent from small holdings of 10 acres to large farms of 600 acres, all arable. The number of small holdings is very large, the proprietor being anxious to hold out inducement to careful ploughmen, labourers, and others to take crofts or small farms equal to their means, and thus to retain the working population in the country. Many important changes have been introduced in the general system of farming on the property since 1850. Artificial manures are now very largely applied, the turnip break has been doubled in extent, and on many farms double the number of cattle and sheep are kept now, as compared with twenty-five years ago. In addition to the reclamation of these 1000 acres, Mr Macleod has erected a number of excellent farm steadings, repaired and extended others, drained 5000 acres with tiles, and erected two wooden piers at Invergordon Harbour, at a cost of L.5000. The most correct idea of the extent of these many improvements will be had from the fact that since 1850 Mr Macleod has expended no less than L.40,000 upon his property; and in addition to this, the tenants themselves have expended a very large amount which it would be difficult to calculate.

The larger farms on the Cadboll property lie near to Tarbat Point, but for convenience one or two of them may be noticed here. Mr James Young, the able and enterprising factor on the property, holds the farms of Cadboll, Cadboll Mount, and Lochsliu, which together extend to 1000 acres, and are rented at L.1080. The course of cropping generally pursued on these farms is the five and seven shift, with two years' grass. Turnips are never repeated without an interval of at least five years, but the lighter land is allowed to remain in pasture as long as it retains the grass, and then it is broken up and sown with turnips,

and laid down again with grass. Mr Young's consignments of live beeves to the London Christmas market have been a credit to Ross-shire for several years. He feeds 160 cattle, usually three-year olds, for the southern markets, and winters 60 younger beasts. He breeds none, but buys in the very best crosses to be had throughout the country, and in recent years he has competed creditably with the well-known Aberdeenshire feeders in the Smithfield market. His cattle are fed on turnips and straw, with a liberal allowance of cake and corn during the last two months of their feeding. He also keeps a superior stock of about 400 half-bred ewes, and from these and Leicester-tups he rears from 500 to 600 three-part bred lambs, which he feeds for sale in May or June of the following year. Sheep are fed on turnips and hay, with a moderate quantity of cake and corn during the last two months.

Almost adjoining Mr Young's farms is the extensive farm of Balmuchy, occupied by Mr John Gordon. It extends to 450 acres, all arable, and is rented at L.630. The soil is mostly light fertile loam lying upon the Old Red Sandstone, and has been under cultivation for a very long time. The farm is worked on a six-shift rotation—1st, turnips; 2d, barley; 3d, 4th, and 5th, grass; and 6th, wheat and oats. The land intended for turnips is ploughed immediately after it is cleared of grain, and allowed to lie in the furrow till sufficiently dry in spring, when it is grubbed and harrowed, and thoroughly cleaned. With the exception of a few acres of yellows for early use, the whole break is put under swedes. In addition to 28 loads of farm-yard manure, each acre gets from 6 to 8 cwt. of artificial manure, chiefly dissolved bones and bone ash, with $\frac{1}{4}$ cwt. of nitrate of soda, as a stimulant. The crop of turnips is generally a very heavy one, and very rich in quality. The farm steading was thoroughly repaired by the proprietor at the beginning of the present lease, and is in every way suitable for the advanced system of farming pursued by Mr Gordon. The courts are all under cover, and are very extensive and convenient for feeding, which is here carried on on a most extensive scale. One large court, measuring 87 feet long by 50 feet wide, is covered by one immense roof, and is divided in the interior into stalls, boxes, and folds, which afford ample accommodation for no fewer than 53 feeding cattle. The arrangements for distributing the food are very convenient, and with respect to light and ventilation the erection is all that could be desired. These additions to Mr Gordon's farm must have entailed a considerable outlay on the proprietor, but considering the facilities they afford for the production of beef, the money must be regarded as economically applied. Mr Gordon keeps four cows for a supply of milk, and rears the calves of these cows. He buys in a great many of the best two-year olds

to be had in the country, and usually feeds about 130 cattle in the course of a year. But of cattle feeding more anon. Mr Gordon also leases the large sheep farm of Cashachans, lying on the Achinalt hills, and on the property of Mr Balfour of Strathconon; and here he keeps a stock of Cheviot ewes. The weak ewes and their lambs are drafted down to Balmuchy in December, and fed on grass till the end of January; and in addition to this he buys in about 600 three-part bred hogs in the month of August, and sends them to the Edinburgh market in prime condition for the butcher in the end of April or beginning of May. For the first while they are fed on grass alone, and afterwards they get turnips and a little artificial feeding stuff. They are clipped before being sold, and when killed they usually weigh from 60 to 84 lbs. a head.

In noticing these farms here we have been cutting before the point, and therefore we must retrace our steps a little. In the parish of Kilmuir Easter, the fine old castle of Balnagowan, the seat of Sir Charles W. A. Ross, Bart., lies snugly ensconced in one of the most richly wooded policies in the north of Scotland. The Balnagowan estate is spread over a wide district, and measures about 300,000 acres, of which about 8000 acres are arable, 400 acres under wood, and 288,000 acres under pasture. In 1850 the rental was about L.7000; now it is L.14,343. In 1850 no revenue was derived from fishings, and very little from shootings, while now from these two sources Sir Charles derives an income of L.4035. The actual rental for farms and pasture is thus about L.10,308, which indicates a rise during the past twenty-five years of a little over L.3000. The soil is generally light, except on about 1500 acres, where heavy clayey land abounds. The light land lies on an iron pan or gravelly bottom. The holdings range from crofts of 1 acre up to farms of 400 acres of arable land; and with one or two exceptions, they have all less or more pasture land attached. On farms of above 100 acres in extent, the houses have been very much improved of late, and now form a most creditable feature on the estate. On the other hand, on the small farms they are of an inferior class, built chiefly with stone and clay, and thatched with "divots," overlaid with straw and clay. The proprietor is turning his attention to the improving of these houses, and the work is progressing rapidly. Since 1850 a good deal has been done in the way of fencing. At that time only a few farms were fenced with dry stone dykes, but now, all the large farms and many of the smaller ones are thoroughly fenced. About 10 miles of fencing has been erected during the last two years. The roads throughout the estate are very inferior, and a moderate sum of money might be spent on their improvement with great advantage. About 200 acres of woodland and waste pasture

have been reclaimed, by trenching to a depth of from 15 to 18 inches, within the past thirty years. A large portion of this land, before being reclaimed, was worth only 1s. per acre per annum, while now each acre yields a rent of from 20s. to 30s. The cost of complete reclamation, inclusive of draining to a depth of $4\frac{1}{2}$ feet with tiles, was from L.15 to L.20, and the prospects of remuneration are good. For a few years new land is let at a nominal rent, which rises in regular gradation every five years until it reaches its real value, when it proves profitable to both owner and cultivator. A considerable extent of old land has been drained, and great care is taken in the cleaning out of out-falls and open ditches. All tenants paying upwards of L.20 of rent have leases of nineteen years' duration; but the majority of the crofters are simply tenants at will. Generally speaking, the proprietor executes all improvements himself; and unless other arrangements are made in the lease, the tenant pays interest on the outlay. The average rent of arable land is about 25s. per acre, the extremes being 5s. and 42s. The rise in the acreage rental of arable land since 1850 varies from 5s. to 10s. The supply of labourers' cottages is almost complete, though some of them are of limited dimensions. Servants are mostly all married. The system of rotation generally pursued on the estate is the five-course shift. Few cattle are reared, but a large number of crosses is bought in and fed. The proprietor himself holds the Forest farm, an extensive stretch of valuable pasture land, away up in the parish of Kincardine, on which he has a large and very excellent stock of Cheviot sheep. A considerable breadth has been planted since 1850, and every year so many acres are cut down and so many planted.

The home farm of Balnagown is occupied by Mr John Forsyth, factor on the estate, and it is worked on the five-course shift. A few cross cows are kept, and the home-bred cattle are supplemented by stirks bought in at convenient times. A few are tied up for feeding about the 1st of September, and sent off about Christmas; while the others are stalled in October, and sold off in spring. A large quantity of cake is used in feeding.

One of the finest holdings on the Balnagown estate is the farm of Balnagore, occupied by Mr William Kelman. It extends to a little over 300 acres, all arable, is rented at L.625, and is probably one of the best lying, most compact, and neatest laid-off farms in the county. In 1848 the proprietor took it into his own hands for the purpose of improving it, and on the 13th of June of that year operations were commenced in earnest. The greater portion of the land has been under a sort of cultivation for hundreds of years. At the time the improvements commenced there were, in the words of a talkative inhabitant of the parish, no fewer than "thirteen reeks on the farm," mostly the

“reeks” of crofters’houses. Part of the low-lying land was in a wet, marshy, useless condition, while a portion of the high land was under stunted heath and green pasture. Squaring off the fields was the first operation; and this, a most important point in connection with land improvement, was done neatly and tastefully. The whole of the farm was then thoroughly drained with tiles, brought into Invergordon by sea. The draining done, the land was then ploughed with a heavy implement drawn by three powerful oxen. Hedging was planted around the farm and between the fields, and double wooden fences erected to protect the plants in their tender years. These wooden fences were continually breaking down, and in 1853 substantial wire fences were erected in their stead; so that, in addition to the hedges, which are now full grown, and which greatly beautify and enliven the landscape, the whole farm is enclosed and subdivided by double wire fences. The Fearn public road passes through the farm; and for local convenience, an excellent turnpike road was constructed right down the centre, striking off at right angles from the district thoroughfare. A large and very convenient farm-steading, with a steam thrashing-mill, was erected at the same time. The improvements lasted well-nigh four years, and cost close on L.9000—rather a large sum to be expended on one farm in those days. About twelve or fourteen years ago, a handsome dwelling-house was erected by the proprietor, and recently a large addition was made to it by the then tenant, Mr James Middleton. On the completion of the improvements, Balnagown was leased by Mr Williamson, who was factor on the Balnagown estate for many years, and in the hands of Mr Williamson and his son it remained till about five or six years ago, when it was let to Mr James Middleton, who held it for only two or three years. Mr Kelman, who was formerly the tenant of an extensive farm in the parish of Mortlach, in the county of Banff, entered the farm at Whitsunday 1873, and is working it on the most approved principles. The ordinary five-course rotation is being pursued, and in the live stock department he intends giving the breeding system a thorough trial. He has introduced from Banffshire several very fine black polled cows, and from these and a shorthorn bull he is rearing calves of a very superior kind. He intends breeding about fifteen calves every year; and these, along with a lot of bought-in stirks, will be fed off on turnips and cake when two and three years old.

In close proximity to Balnagown grounds, but in the parish of Logie, lies the valuable little estate of Calrossie, belonging to Mr Andrew Hall. The Mains of Calrossie is one of the finest farms in Rosshire, and is rented by Mr John Douglas for L.676. When Mr Douglas entered this farm about ten years ago, the land was in very bad order, but having been twice thoroughly

cleaned and well cultivated, it is now in excellent condition, and produces very fine crops of all kinds. Almost the whole of the land is old, and lies on sandy subsoil, the soil generally being heavy alluvial loam, ranging from 3 to 4 feet in depth. There are a few patches of stiff clay throughout the farm, which is worked on a five-course rotation. The heaviest of the alluvial land is allowed to lie one year only under grass, a second crop of oats being taken instead of a second year's grass. Wheat follows one of the oat crops, and the land is dunged on the stubble with from 20 to 25 loads of farm-yard manure per acre. Wheat usually yields about 4 quarters and 6 bushels per acre, and seldom exceeds 60 lbs. in weight—which is accounted for partly by insufficient drying in the stook, caused by the numerous clumps of trees throughout the farm. Mr Douglas used to top-dress his wheat with about 1 cwt. of nitrate of soda and 1 cwt. of bone dust per acre, but believing that this tended to lessen the weight of the grain, he has abandoned the practice. He grew no barley for some years previous to 1874, but last year a splendid crop of about 7 quarters per acre, weighing 55 lbs. per bushel, was raised on one field; while this year he reaped an equally rich harvest of barley from a small field after turnips which had been eaten off by sheep. Oats weigh from 43 to 44 lbs. per bushel, and yield very well. The average yield of wheat on Calrossie when Mr Douglas became its tenant was only about 2½ quarters per acre, and that of other varieties of grain was correspondingly low. Mr Douglas pays special attention to the cultivation of the land intended for turnips. Early in autumn he ploughs it, in spring he grubs it and rolls it, and grubs it and rolls it again, if necessary, and harrows it thoroughly with rank iron harrows. Thorough cultivation is found to be a great advantage, not only to the turnips, but also to the grain crop which follows, especially when that crop is barley. From 7 to 8 cwt. of artificial manure—bone manure chiefly—and about 25 loads of farm-yard manure are allowed to each acre, and very fine crops both of swedes and yellows are grown. A good deal of the turnips is eaten off by sheep, the "stripping" system (*i.e.*, pulling the one drill and leaving the other) being adopted occasionally. Mr Douglas buys in from 400 to 500 three-part bred lambs in August, and gives them foggage and grass till the middle of October, when they are put on white and yellow turnips till the New-Year. They are then fed on cut swedes, hay, and a ½ lb. of linseed-cake per day, which is by and by increased to 1 lb., and at the 1st of April this is supplemented by an equal weight of grain. As soon as they are clipped—about the middle of May—they are sent to the market, and usually average about 70 lbs. in weight. A large number of cattle is also fed at Calrossie, but of this more anon.

The farm horses are strong and heavy, with a dash of the Clydesdale. The farm-steading is good and the dwelling-house excellent, having been recently enlarged by the proprietor. Two new and commodious labourers' cottages have also been recently erected by the proprietor.

Another valuable little property in this neighbourhood is the estate of Allan, belonging to Mr David Monro, an enthusiastic agriculturist, and a gentleman of ability. He cultivates the home farm of Balinroich himself, and has taken a lively interest in the agriculture of Ross-shire for many years. The soil on the greater part of Balinroich is very rich fertile loam, and the finest crops of every kind are raised on the farm. A part of it has been under grass for many years, and still affords most valuable pasture for cattle, and in these days of expensive labour, it is more remunerative to retain it under grass. Mr Monro buys in cross stirks, and feeds them off when two and three years old. Allan House, with its beautiful garden, spacious lawn, and magnificent trees, lies in the centre of Balinroich, and is one of the most charming residences in the county. Mr Monro at one time farmed the whole of his estate himself, and about thirty years ago he reclaimed about 100 acres of rough, marshy land, on the farm of Clay of Allan, which forms the other part of the estate.

About eight years ago Mr Jonathan Middleton took the "Clay" on a lease of twenty-one years, at a rent of L.1039. The Clay extends to about 570 acres, and lies almost as level as a billiard-table. The soil is mostly strong adhesive alluvial loam, with here and there subsoil beds of sand. Mr Middleton takes two grain crops in succession, after one year's grass—first oats, and then wheat on his best land, and wheat and barley after turnips on the second-rate land. His course of cropping, therefore, is as follows:—*Best land*—1st, turnips; 2d, wheat; 3d, hay; 4th, oats; 5th, wheat. *Second-rate land*—1st, turnips; 2d, wheat; 3d, barley; 4th, grass; 5th, oats. This rotation may seem rather strange, but it has been found to suit the peculiarities of the soil better than any other yet tried. Every corn crop grown on the farm is top-dressed, and the cross-cropped wheat is heavily dunged in autumn. The hay crop is also well top-dressed, and for his outlay for top-dressing Mr Middleton usually finds himself handsomely remunerated. Besides feeding about 300 cattle (to which we shall afterwards refer), he feeds about 500 sheep every year. The sheep are bought in as lambs from local sheep-farmers in the beginning of August, and are kept on grass till the first of November, when they are put on turnips and hay, *ad libitum*. About the first of February a small allowance of cake is given them, and in the end of April or beginning of May, they are clipped and sent off to the market.

Mr Middleton has been cultivating part of his land by steam power during the past two seasons, and as far as can yet be ascertained the effect is likely to be beneficial. The land intended for turnips is very carefully cultivated and heavily manured, and the crop of turnips usually ranges from 25 to 30 tons per acre.

Leaving the Clay and proceeding eastward, we pass the extensive farm of Fearn,* so long occupied by the late Mr George Middleton, the neat, well-managed little farm of Mulderg, leased by Mrs M'Gregor and family, and the compact little estate of Rhynie, which has been considerably improved of late by its owner, Mr John Robertson, and reach the property of Geanies, belonging to the heirs of the late Mr Kenneth Murray. We were invited by the late Mr Kenneth Murray to visit his picturesque residence and valuable little estate, on Saturday the 8th of July last, and fearing that he would be unable to return from a business trip to Stirling to meet us at Geanies, he favoured us with a letter of introduction to his eldest son, asking him to show us "the house and grounds, and be hospitable!" He was there himself to welcome us, and exercise that hospitality which was so characteristic of him; but alas! poor man, he is now no more. While on a visit to the Duke of Sutherland at Dunrobin Castle, along with Sir Salar Jung, he was taken suddenly ill, and on Monday, the 24th of July, he died, his death being sorely lamented by a very wide circle of friends. The late Mr Kenneth Murray was a gentleman of no ordinary stamp. His business capacities were indeed wonderful; and besides acting as the Duke of Sutherland's chief adviser in the carrying out of the extensive reclamation works now going on at Lairg, and managing his own property and superintending improvements and changes on several other estates throughout the country, he acted as agent for the Commercial Bank of Scotland in Tain, was Provost of that burgh, and paid close attention to all matters connected with the county. His experience as an agriculturist was extensive, and by farmers and others his advice was often asked, and always heartily given. Verily, we shall not soon look upon his like again!

In 1840, when Mr Kenneth Murray obtained charge of the estate of Geanies from his late brother, Mr William Murray (who died about ten years ago, leaving Mr Kenneth as proprietor) the arable area was only 2016 acres. But Mr Kenneth immediately began improving and reclaiming, and in a wonderfully short time he extended the arable land to about 4000 acres. The new land was reclaimed partly from moor, partly

* Since the above was written the farm of Fearn has been let, along with Mulderg, on lease of nineteen years, to Mr James M'Gregor and Brothers, at a considerable rise on the former rent.

from bog and moss, and partly also from lochs. Lochs were at one time very numerous in this district, and in consequence the inhabitants were frequently troubled with ague and kindred diseases. Mildew used to prevail greatly, but the thorough draining of several of the smaller lochs and the land around them has done away with it entirely. In 1843, the rental of the estate was L.2160; now it is L.4397. The mansion-house of Geanies is beautifully situated on the top of a mound, terminating abruptly in the Moray Firth. The garden and grounds are magnificent, and from the lawn in front of the house a most delightful view is obtained across the Moray Firth, and all around on the right and left. An eminent Scotch professor, who happened to visit Geanies shortly before the death of Mr Murray last summer, remarked to the writer, that, "without doubt it is the finest view of the kind in Britain, if not indeed in Europe!"

The land reclaimed by Mr Murray turned out exceedingly well, and of this one notable instance may be given. About thirty years ago a field of 20 acres, near the public road from Fearn to Tarbat, was reclaimed and cultivated according to the advice of the late Mr George Middleton, and manured well with farm-yard manure and fish garbage, and sown with wheat in the month of November. The crop came away very well, and no less than 5 quarters of very fine grain were reaped off each acre, the variety of wheat being Red Lammas, supplied by Mr Monro of Allan. For this very fine sample of grain, weighing 64 lbs. per bushel, Mr Murray obtained only 36s. per quarter!

The home farm of Geanies is leased, along with the large farm of Ardboll Mains, by Mr William Douglas. Both are worked on the usual five-shift rotation, and by liberal and systematic farming the richest crops of all kinds are usually produced. The farm of Ardboll has already been referred to as the scene of early agricultural improvements, and within the past thirty or forty years it has been greatly improved by draining and fencing and the like, chiefly by the late Mr Douglas, father of the present enterprising tenant. On the compact little estate of Rockfield, the proprietor, Mr Munro, has executed considerable improvements of late.

Retracing our steps from Tarbat, through Fearn, and turning away northwards into Tain, we pass from a rich agricultural district to an immense stretch of thin, barren, mossy land, intersected here and there with small patches of arable land. The small estate of Bogbain, containing one moderately-sized farm and four crofts, lies only about a mile northwards from Fearn Station, around which the land is rented at about L.2 per acre; and yet the soil on Bogbain is so very thin and unproductive as to be worth very little more than 10s. per acre. The subsoil is

almost as close and retentive as a block of hardwood ; and when water collects on the hollows of the fields, which it often does in consequence of the low level at which the estate lies, a considerable time usually elapses before it wholly disappears. It is no uncommon thing in a wet harvest to see the sheaves of grain submerged in a flood of water.

The majority of farms in the parish of Tain are small, and in Edderton there are very few large farms. The larger portion of the latter parish is on the estate of Balnagown, which has already been noticed pretty fully. The largest farm in the parish is Ardmore, occupied by Mr George Cruickshank, and situated on the Balnagown property. It extends to about 400 acres of arable land, and 400 pasture, and is rented at L.662. The soil generally is light, and the climate very dry. The five-shift rotation is pursued, and very fair crops are raised. Mr Cruickshank has reclaimed close on 150 acres during the past nineteen years, mostly at his own expense, and has otherwise improved the farm. No cattle are bred on the farm, but a good many are bought in and fed off during the winter with turnips and from 2 to 6 lbs. of cake per day. Mr Cruickshank also holds the large sheep farm of Strathbran, in the parish of Contin, and here he keeps a stock of Cheviot sheep.

The parish of Kincardine contains an immense stretch of pasture land and only a few large arable farms. On the little estate of Invercharron, around Bonar Bridge, there is a small tract of very fine arable land, worth about L.2 per acre. The farm of Mains of Invercharron is occupied by Mr James Davie, a native of Aberdeenshire, and is rented at L.400. The soil on the most of the farm is rich alluvial land, and under Mr Davie's liberal treatment it yields excellent crops, both of grain and turnips. Wheat often yields as much as 5 quarters, and the average is about 4 quarters. Oats average about 5 quarters, while as many as 30 tons of turnips are grown on an acre. Mr Davie breeds very few cattle, but he feeds a good many, selling them off as two and three-year olds. A small portion of the Ardross estate lies in this parish ; here also improvements have been executed by Mr Matheson. In 1847, when the potato-disease left so many Highland homes destitute of food, Mr Matheson organised a scheme whereby the starving natives were tided over their difficulties, and his own estate and the country generally very considerably benefited. Plans were drawn out and arrangements made for the reclamation of large stretches of waste land, and at these works the natives were employed and remunerated for their labour by meal and money for the maintenance of themselves and their families. In this way the greater portion of the farm of Upper Gledfield was brought under cultivation. It extends to 180 acres, and is leased by Mr George Anderson at a

rent of L.162. The soil generally is thin, but fairly productive. The fields are nearly square, and well fenced with dry stone dykes. The five-shift rotation is pursued, oats being the predominating variety of grain. From 10 to 12 acres are usually put under barley, and the yield averages close on 4 quarters per acre. Oats range from 4 to 5 quarters, and weigh about 43 lbs. per bushel. The exposure is northern, and harvest is seldom commenced before the first week of September. The land was limed with about 20 bolls per acre when reclaimed, and the effect of the lime is still appreciable on the grass, though the most of the farm would be better of another dose of this valuable fertiliser. Only a few cattle are fed, and consequently Mr Anderson seldom manages to spread his farm-yard manure over more than about half of the turnip land, the other half being laid down with from 2 to 3 cwt. of bones and superphosphate. The turnips grown by artificial manure are eaten off by sheep, and thus the land is partly compensated for the want of the more substantial manure from the court-yard. Ten cross cows are kept, and the progeny of these are usually fed off as two-year olds. A small outrun is attached to the farm, and on it about 200 blackfaced sheep are grazed.

Wester Ross.

This division contains by far the greatest number of acres, but consisting, as it does, almost entirely of high hills and sheep grazings, it is of little importance in a purely agricultural point of view. The arable area in the whole division is very small, and indeed there is no great encouragement, either to landlords or tenants, to add much to it. For sheep farming, however, Wester Ross is quite as favourably known as Easter Ross is for arable farming; and it is the combination of these two branches of rural industry in such perfection that places the counties of Ross and Cromarty so well into the front among the other counties in Scotland.

Mr Matheson's extensive improvements on the west coast have already been noticed, and now we shall refer briefly to the operations of another enterprising proprietor of hill lands in Ross-shire, Mr John Fowler of Braemore. The estate of Braemore was purchased by Mr Fowler, who is well known in engineering circles in London, in 1865, and the adjoining property of Inverbroom in 1867. The total acreage of both is about 40,353, and the annual valuation about L.2500. They lie in the parish of Lochbroom, and are very romantic and mountainous. Immediately on obtaining possession, Mr Fowler began improvements in real earnest, planting having been commenced in the autumn of 1865. By the end of the season of 1867 about 1000 acres had been planted and fenced; and since then other 200 acres have

been put under wood, mostly Scotch fir and larch, with a few spruce and hardwood trees, where the ground was thought suitable for these varieties. In the autumn of 1866, the erection of a mansion-house commenced, and in two years it was completed and ready for occupation. It is a very handsome structure, and stands on the side of a hill, looking right down Lochbroom, and commands views, in front, to the right, and to the left, which for grandeur and extent it would be difficult to surpass. A large garden and vineries were also constructed, while at the same time a commodious range of stabling and other houses was erected. On Inverbroom there is a considerable extent of arable land along the river sides, and of this several acres have been reclaimed and improved by Mr Fowler. A good deal of the old land has been drained, and the fields squared up and fenced. In addition to all this, several miles of roads and hill paths have been made, and three very handsome iron bridges have been erected. One of these bridges carries a roadway over the river, and has a span of 100 feet; and another is a light foot suspension bridge, thrown over the picturesque gorge of Corrie-Halloch. This gully is described as a high longitudinal fissure in the mountain side, over a mile in length, and from 200 to 300 feet in depth. The bridge is 84 feet in span, and crosses at a point where the river takes a sheer leap downwards of about 100 feet; and the view obtained while standing on the bridge is not surpassed by anything of the kind we have ever seen in the Scottish Highlands. Mr Fowler has also expended a good deal of money in improving the accommodation for salmon and trout in the river and lochs, and even yet minor improvements are being carried out every season. Sir Ivor B. Guest, the enterprising proprietor of Achnashelloch, has also effected great improvements on his mountainous property, by planting, fencing, building, road-making, and reclaiming small pieces of land; while on the estate of Lochcarron not a little has been done.

The Lewis.

In 1844 this immense tract of land, extending to 417,416 acres, was purchased from the Seaforth family by Sir (then Mr) James Matheson. Immediately on obtaining possession Sir James began improvements on a very large scale, and ever since they have been carried on with surprising vigour and enterprise. In 1844 the condition of the Lewis was primitive in the extreme, and even after thirty years of great activity and heavy expenditure of money, the island is hundreds of years behind the social standard of the nineteenth century; so gigantic and so stubborn is the subject with which Sir James has had to deal. We cannot acquiesce with those modern tourists and other writers, who so unmercifully denounce the landed proprietors of the High-

lands of Scotland for what they are pleased to call their "utter neglect of the many hundreds of starving subjects that live among their hills and glens." No doubt, more activity and consideration might be displayed in one or two individual cases, but we maintain, that over the country generally a great deal more is being done at the present day for the amelioration of the population of the Highlands than at any previous period of our nation's history. Many influences combine to make improvement in the Highlands a very slow process; but, nevertheless, a great stride has been taken in the march of civilisation during even the last quarter of a century. And we make bold to say, that no living man has done more in this good work than the respected proprietor of the island of Lewis.

Since 1845 Sir James has trenched, drained, enclosed, and divided into farms and crofts about 900 acres, and drained, remodelled, and fenced another 1000 acres, most of which had previously been under rude cultivation. In addition, the extensive grounds which surround the castle have been thoroughly trenched, drained, and levelled; and within the policies large tracts have been laid out in pasture grass, part of which is kept for meadow hay. All the farm-houses and steadings on the estate have either been built anew or added to and repaired by Sir James; and substantial assistance has been, and is still given, to the crofters, to enable them to improve their houses, crofts, and gardens. When it is remembered that there are about 3500 crofters' houses on the island, and that wood, lime, and slate have all to be imported, it can well be imagined what a huge and expensive task the thorough improving of these holdings really is. Railways are as yet unknown in the Lewis, though an approach has been made in a line of tramway about four miles in length, laid for the conveyance of the estate peats from the peat banks to the cart roads. Since 1844, about 170 miles of thoroughly substantial roads have either been made anew or completely overhauled and repaired, supplied with firm stone and lime or wooden bridges. Soon after Sir James got possession, the work of building a castle was commenced; and in 1870 a handsome and imposing pile was completed, at a cost of L.40,000. The ground around the castle was at one time very rough and uneven; and in bringing this into harmony with the castle, Sir James has expended close on L.49,000. Within these policies large gardens have been laid out, and numerous walks and carriage drives constructed with true artistic taste. The result of all this outlay of money and labour is, that Sir James possesses a castle and policies, which for beauty and extent compare favourably with any in the kingdom. In various other ways, in educating and feeding the population, in improving the town of Stornoway and its harbour, in planting woods, &c., Sir

James has also expended much labour and money. Instead of dilating further on all these undertakings, we simply subjoin a table of his principal expenditure, as the best way of affording a correct idea of the magnitude of his works :—

Improving land and building tenants' houses,	L.134,000
Laying out castle, policies, and gardens,	48,838
Building castle,	40,000
Relief to the population in 1846 and 1847,	37,356
Constructing bridges,	4,000
Constructing roads,	22,500
Building and maintaining schools,	10,900
Planting and fencing woods,	9,150
Erecting a slip at Stornoway harbour,	6,000
Erecting quays and breastwalls (chiefly at Stor- noway), }	2,300
Fishing stations and store houses,	1,196
Emigrating natives,	10,069
Brick and tile works,	4,000
Total,	<u>L.329,409</u>

In addition to this immense sum, Sir James expended many smaller sums for the benefit of his estate and its inhabitants; and, with the exception of L.30,000 obtained from the Government Drainage Loan Commissioners, the whole outlay has been direct from his own purse. In the years 1846 and 1847 the potatoes in the Lewis, as in the north generally, were destroyed by the potato blight, and the inhabitants left almost destitute of food. At this juncture Sir James came forward with true and characteristic liberality, and imported large quantities of meal, potatoes, &c., for distribution among his starving tenants, who afterwards repaid him by labour to the extent of L.23,531.

The agriculture of the Lewis is so peculiar to itself, that instead of treating of it along with the mainland of the county, we shall here discuss it as concisely as possible. According to a return taken up in 1875, there were in all 14,362 acres under cultivation and permanent pasture, exclusive of hill, moor, and mixed grass and heather pasture. These acres were disposed as follows :—

Bere or barley,	2,842 $\frac{3}{4}$ acres.
Oats,	2,639 $\frac{1}{2}$ „
Potatoes,	3,652 $\frac{1}{4}$ „
Turnips,	210 $\frac{1}{4}$ „
Carrots,	6 $\frac{3}{4}$ „
Fallow,	68 $\frac{1}{2}$ „
Rye grass and clover,	265 $\frac{3}{4}$ „
Permanent pasture and natural hay, 4,676	„
Total,	<u>14,362</u>

Fishing and cultivating crops are the chief industries in the Lewis; but to the crofting system we will afterwards refer. There are only thirty-six farms on the island, and most of these are small, their total rental being L.4827, 16s. 10d. On twelve of these farms cultivation is carried on to a pretty large extent; on fourteen a few acres are cultivated to assist in keeping the cattle over winter; on the other ten there is scarcely any cultivation at all. In the parish of Stornoway there are twelve farms, upon ten of which cultivation is practised largely. These, in fact, are the only farms on which systematic agriculture is pursued in the Lewis. The rotation pursued on these farms is either the four, five, or six-course shift, and the crops are oats, bere, turnips, hay, and the usual pasture for one, two, or more years. Oats usually yield from 3 to $4\frac{1}{2}$ quarters per acre; bere or barley from 3 to $3\frac{1}{2}$; potatoes, about $\frac{1}{4}$ tons; swedes from 18 to 24 tons; yellow turnips, 19 to 26 tons; and hay from 80 to 120 stones per acre. Of the twelve farms in the parish of Stornoway, the total rental is L.1501, the smallest rent being L.35, and the largest L.320. Around Stornoway there are twenty-seven parks, let to townspeople at rents from L.1 to L.3, 10s. per acre, the total rental of these fields being L.272. There are also fifty-seven lots of potato land of $\frac{1}{4}$ of an acre and upwards in the neighbourhood of the town, and these are let to townspeople at a total rental of L.40, 9s. The other twenty-four farms are mostly devoted to the rearing of sheep and cattle, and are apportioned among the other three parishes as follows:—Barvas, eight farms, with a rental of L.510; Lochs, six farms, with a rental of L.1093; and Uig, ten farms, with a rental of L.1410.

According to the Board of Trade Returns, the number of cattle in Lewis in 1875 was a little under 12,000. On the farms in the Stornoway district and on a few others, the cattle were mostly Ayrshires, or crosses between the Ayrshire and other breeds; but on the grazing farms on the other parts of the island, as on the crofts, the cattle are of the Highland breed, and generally of an inferior class. The Lewis farmers, like many of their brethren in other parts of Scotland, breed too few cattle for themselves, and have too often to fill their byres with the inferior animals reared on the crofts around them; and thus they deprive themselves of the full returns their farms are capable of affording them in the shape of beef produce. On some of the better grazing farms, a few Highland cattle of really good quality are bred, and for these there is always a ready market. Some of the farmers in the parish of Uig send off a fair number of good Highlanders every year, and usually obtain good prices. Mr James Mackenzie, who leases the largest farm in this parish, Lynshader, owns the finest herd of Highland cattle in the island; he sells about one hundred head every year, and this season he obtained

£.15 a-head for a fine lot of thirty-three three-year old Highland bullocks at the farm. The Lewis cattle are sold off, partly at the Stornoway market, which is now held three times a year (instead of twice, as formerly), and partly to dealers who traverse the island, buying up the cattle for the Stornoway butchers. A large number both of cattle and sheep are purchased annually by Mr Samuel Newell, Skipton, Yorkshire, who leases two farms in the parish of Stornoway, and these are sent either to Skipton, Glasgow, or Falkirk Tryst. About 1500 cattle leave the island annually, and in addition, between 200 and 300 are slaughtered in Stornoway. It will thus be seen that about one out of every seven or eight of the Lewis cattle is converted into money every year.

The Board of Trade Returns for 1875 state the number of sheep in the Lewis as follows:—

One year-old and upwards,	.	.	43,414
Lambs,	.	.	18,063
			<hr/>
Total,	.	.	61,477

Considerable difficulty is usually experienced in obtaining correct returns from the crofters, and therefore these figures can hardly be guaranteed. The principal sheep farms are Park, in the parish of Lochs; Lynshader, in Uig; Galson, in Barvas; and Gress, Tolsta, Coll, and Aignish, in Stornoway. Besides these there are eleven farms upon which sheep stocks of from 350 to 700 head are kept along with cattle, and a few others upon which there are from a few scores to one or two hundred sheep. The breeds kept are Cheviots, Blackfaced, and crosses; and for a few years past half-bred and grey-faced lambs have been tried on two farms. The farm of Park, extending to upwards of 70,000 acres, is rented by Mr P. P. Sellar, at a rent of £.778, 2s. On the best of the land he keeps a hirsel of ewes, and on the more moderate parts a stock of wethers are grazed. Mr Sellar leases a large extent of sheep grazings in the mainland of the county, and from these he brings the wether hogs to Park in the month of April, retaining them there till they are two years and five months old, when they are removed in the month of September for feeding. Mr Sellar also rents land from year to year in the neighbourhood of Stornoway, and here he winters hoggs and Dinmouts, and lambs, and the weaker portion of the Park ewes. Mr Mackenzie, Lynshader, leases some of the finest grazings in the island, and pays a rent of £.425. He is more a breeder of Highland cattle than a sheep farmer, but still he keeps a very fine flock of Cheviot sheep, and sends away from three to four hundred well-conditioned sheep every year. Galson is the next largest sheep farm. Mr Smith, from Caithness, entered this

farm at Martinmas 1869, but after trying several experiments with his stock, and getting a good deal of money laid out on the farm, he handed over his lease at Whitsunday last to Mr Helm, tenant of the Holm farm, in the parish of Stornoway. Mr Helm now holds, in addition to Galson, the Barvas Glebe grazings, on the north-west side of Lewis; the farm of Holm and the Sandwich Hill parks, &c., on the south-east side of the island, and a large sheep farm in Morven, in Argyllshire. He keeps a mixed stock of Cheviot, Blackfaced, and cross ewes on Galson; and this season he had four different breeds of lambs for sale off the one farm—rather too many kinds for a farm that is barely able to maintain a stock of 2000 sheep. Mr Helm took over this mixed stock from Mr Smith, and it is more than likely he will take an early opportunity of reducing the number of breeds. The next largest sheep farmer in the Lewis is Mr Samuel Newell, already referred to. He leases Aignish and Tolsta for L.220, and has perhaps the best managed ewe stock in the Lewis. Between twenty and thirty years ago the sheep stock on these farms were little better than those reared by the crofters; but since that time they have been carefully bred and fed, and are now as fine a flock of Cheviot sheep as any in the island. In 1875 Mr Newell got the old arable farm of Aignish to be managed as a grass farm (Yorkshire graziers know how to manage farms of this kind). Both proprietor and tenant have done much to improve the farm within the last eighteen months; and by this extension of territory, Mr Newell and his nephew, Mr Thomas Newell (who is acting manager in Lewis), have been able to improve their sheep stock still further, and also extend their cattle-dealing operations in the island. On the farms of Gress, Coll, and Tong, Cheviot sheep (mostly ewes) are kept along with cattle. Upon other six sheep and cattle farms in Uig, and four in Lochs, the sheep stocks are Cheviot, Blackfaced, and crosses, partly ewes and partly wethers, the ewes being sold off when five or six years old, and the wethers when three years old. On the regularly managed sheep farms, where the sheep stock is mostly or wholly ewes, the annual sales are the wether lambs, the shott ewe lambs, and the cast ewes. Generally speaking, the Lewis farmers pay more attention to their sheep than their cattle, and do not overstock their land with the former as with the latter. In all, the Lewis farmers sell annually from 3000 to 3400 old sheep, and 1600 lambs; the greater portion of the stock being sent out of the Lewis every year.

The number of horses of all kinds in the Lewis in 1875 was 900, the majority being small ponies kept by the crofters. On the smaller farms middle-sized ponies are kept for light carting and for cultivating their land. On the larger farms the horses are rather under-sized, but lively and durable workers. Sir

James has imported thoroughly good stallions at various times to improve the native breed of horses, and at his manor farm, so skilfully and carefully managed by Mr Gavin Fowlie, two or more stallions are always kept for the benefit of the different classes of tenantry in the island. Lewis horses, however, stand in need of improvement in feeding, usage, and grooming as in breeding. Small one-year old ponies sell at from L.5 to L.7, older and larger from L.15 to L.30, and the better class of farm horses from L.40 to over L.50.

In 1875 pigs of all ages numbered 600. These are confined chiefly to the north-west side of the island, whence they are mostly shipped in store condition to Glasgow in winter and spring. Very few pigs are kept by the crofters, and what they do rear are of an inferior sort.

Cotter Farming.

As already hinted, the number of small holdings in the counties of Ross and Cromarty is very large; in fact, the number of holdings under 20 acres in extent is not far short of 6000, and this we regard as a very important and in some respects a highly satisfactory feature in the rural economy of these counties. There is no doubt much to be said against the crowding together of too many of these small holdings, but much more could be hurled against the policy that would completely abolish these little homesteads. A few crofts in an agricultural district are as essential to the welfare and prosperity of that district as farms of five or six hundred acres: the one without the other is incomplete; both combined make a perfect whole. Without crofts and small farms the native supply of labour would very soon become exhausted; and again the frugal, industrious tenants of these small plots of land add largely to the arable area of a county by whole lifetimes of incessant toil with pick and spade. What has been done in this way in the counties of Ross and Cromarty is really marvellous, in fact many hundreds of acres have been brought under cultivation by the crofters' pick and spade during even the past twenty-five years, and still they are as lively at work as ever. It is invariably the case all over the country that crofters and cotters are planted upon the thinner soils and higher lying tracts of land—tracts that are usually easily reclaimed, but seldom of a kind that would remunerate cultivation on a large scale. Generally speaking, the counties of Ross and Cromarty form no exception to this rule, though in several districts there are a few patches of very fine land taken up by crofts. Those who occupy these better soils grow very rich crops both of grain and roots, and by care and frugality they live very comfortably. Some sow small patches of tares and pay their rents by disposing of the seed, while others work

in a similar way with beans. Many hundreds of these crofters are located in the Black Isle, chiefly on the more elevated parts, and of how these "live and move and have their being" some idea will be had from our remarks upon the ancient commonalty of Mulbuie. Both in Mid and Easter Ross crofts and small farms lie in scores, chiefly in straths and river sides along the eastern base of the irregular range of hills that occupy such an immense extent of the western division of Ross-shire. These holdings vary from 5 to 20 acres in extent, and only in a few cases have the whole been brought under cultivation. The bringing of these crofts to what they are has been the work of hundreds of years, and even yet there is much to be done. In too many cases the little fields are unshapely and unequally divided, while small unseemly patches of waste land frequently lie into the arable land in dovetail fashion: occasionally, in fact, these ugly patches are to be seen right in the centre of an arable field. Time, however, is gradually dispelling these unpleasant features of the crofting system, and where they have already disappeared, and where taste and care have been bestowed on the cultivating of the land, the homestead of the crofter has a quiet comfortable serenity about it that is very pleasing to observe. The produce of these small holdings of course is not sufficient to maintain a large family, and the home-revenue is eked out by employment which is always to be had on the neighbouring farms. Along the west coast there are many hundreds of crofters, but these work on a rather different system from the majority of those on the east coast. Their holdings range from 5 to 10 acres in extent, little more than one-half of which is under cultivation, and instead of eking out the produce of their land by agricultural labour they ply the oar and net, and in a good fishing season they make a very comfortable living. Generally speaking, however, the crofters on the west coast, chiefly because of the want of agricultural employment in the neighbourhood, are not so well to do as their brethren in the eastern districts of Ross and Cromarty. Their houses are generally bad; and in some cases they are mere hovels, combining under one roof the crofter's abode and cow byre. These little houses are usually divided into three apartments by low loose wooden partitions—one for the cows, one for the crofter and his family to sit and eat in, and one for beds for sometimes six or seven grown-up men and women. On Sir Kenneth S. Mackenzie's estate of Gairloch there are some 400 or 500 crofters, whose holdings average only about 5 acres, of which there is frequently little more than one-half under cultivation. They have all a share in a common outrun for sheep and cattle, but their living is in the main derived from the sea and from wages earned in the south in summer. The course of cropping

followed by these crofters is rather curious. Of the crofters on Sir Kenneth's estate only about 100 pursue a regular rotation, and that rotation is a four-course shift—one year's grass, one green crop, principally potatoes, and two grain crops, chiefly oats. The majority of the crofters follow what they call a four-course shift, but then they have three-fourths of their land under oats, all manured with about 30 loads per acre of sea-ware and cows' manure, and one-fourth under potatoes; the three crops of oats coming in succession. A few follow a three-course rotation—two successive crops of oats and barley manured as above, and one of potatoes; and others, where crofts are small, and who have only one cow and one stirk or two cows alone, pursue a two-course rotation—one crop of oats and barley and one of potatoes. Only a very few turnips are grown. In some exceptional cases, where part of the croft is wet and insufficiently drained, oats are sown year after year for more than a dozen of years, the land being heavily manured every year with sea-ware. Again, the dry portion of the croft is cropped with potatoes for ten or fifteen successive years, and manured every year with cows' manure and guano. About one-fourth of the crofters use from 1 cwt. to $1\frac{1}{4}$ cwt. of guano for their potato shift, which is generally about 1 acre in extent. The guano and cow dung are found to suit very well together, the potatoes grown by their manuring being generally drier and of finer quality than those grown by sea-ware or even dung alone. During the past eight or ten years better crops of oats are grown on account of seed having been introduced from Caithness through Sir Kenneth's west coast manager, Mr Donald Mackenzie; while the potatoes have also been improved both in quantity and quality by the crofters having been supplied with fresh seed at intervals during the past dozen years by their liberal and indulgent landlord, Sir Kenneth. Before the Caithness seed was introduced a quarter of oats grown on these crofts would scarcely return a boll of meal, and the weight per bushel seldom exceeded 35 lbs. Now the average weight per bushel is close on 40 lbs., and the yield per acre varies from 2 to 3 quarters. One cow is kept for every acre of arable land, and when this ratio is exceeded oats have to be given to the cattle in spring without being thrashed, in order to keep the animals alive. In an open winter the cattle are kept out on the hills with very little straw till the beginning of February, and from that time till the 1st of May they get straw and hay regularly. Almost all these crofters sit under leases of twelve years' duration, and pay rents varying from L.4 to L.8, the average being about L.5.

Numerous as these crofters are on the west coast of the mainland of Ross-shire, the island of Lewis is undoubtedly the stronghold of the fisherman-crofter. In the Lewis there are no

fewer than 110 crofter townships, containing 2750 crofters, and on many of these crofts more than one family reside. These townships are in four groups. In the parish of Stornoway, chiefly around Broad Bay, there are 942 crofters, paying a gross rental of L.2393; in the parish of Barvas and part of the parishes of Lochs and Uig, from Callenish to the Butt of Lewis, there are 1059 crofters, paying a gross rental of L.3247; in the south-western corner of the island, in the parish of Lochs, there are 491 crofters, paying a total rental of L.1390; and in the western corner of the island, in the parish of Uig, there are 226 crofters, paying a gross rental of L.941. The total rental derived from these 2750 crofters is L.7972, 7s. 4d., or an average of L.2, 18s. from each. In addition to his croft each crofter has a right to common pasture on the moors along the whole length of the centre of the island, which enables him on an average to keep four cattle and ten sheep. The average yearly produce of 2000 of these crofts is about 8 bolls of meal and 4 tons of potatoes, the soil on the remainder being so thin and unproductive that the yield of both grain and potatoes is considerably less. Only a very few pigs are kept, but a large number of eggs are produced, and exported to southern markets.

The system of cultivation and general management followed by the Lewis crofters are even more strange than those pursued by their brethren in the mainland of the county. No regular course of rotation is followed, and the system of manuring the potatoes is, perhaps, the most primitive pursued in any part of Scotland at the present day. The grain is not cut in the ordinary way, but pulled out of the ground by the hand, and after being bound up in sheaves the root ends are cut off. The dwelling-houses are built purposely without chimneys, roofed with a close "sarking" of sticks, and thatched with these pieces of stubble, which are spread thickly, and held down either with straw or heather ropes. To make the system understood, we shall suppose that a house has been erected about the beginning of summer, and roofed and thatched in the above manner. By the time winter sets in another supply of stubble ends has been procured, and a second layer of these is put on to keep out the cold and in the heat! When spring arrives the uppermost layer of thatch is taken off and laid carefully aside, and then the lowermost layer, which has by this time become richly mixed up with soot, is also taken off and spread upon the potato drills. The layer of thatch which had been laid aside is then replaced on the house, is overlaid with another layer of stubble ends in autumn, and utilised as potato manure in spring; and from year to year this strange old system has gone on for several generations. Soot is well known as a powerful fertiliser, and the Lewis crofters find it a most suitable manure for potatoes. Of course a good many

have abandoned this ancient practice, but still a large number adhere to it. The whole of the older houses on these crofts, as already stated, are minus chimneys, and otherwise they are of a most primitive description. They are long, low, and round in the roof, and in general outward appearance they closely resemble a magnified potato pit. The walls are mostly constructed of turf, and are in some cases 3 or 4 feet thick. The roof generally starts from the inner edge of the wall instead of projecting beyond it; and "in this way (says a writer in the *Scottish Farmer*) I have seen something like a series of terraces extending over half a town or township. One use of them was that when the children became troublesome, or the mother was more than usually busy, the children were disposed of on these terraces or high places; and it was quite amusing to see the little *whitterets* looking down over the wall at what was going on below." The interior of the house is quite as primitive as the exterior. In most cases the people and cattle are all stowed away under one roof, the end at which the only door in the building opens being partitioned off by a box-bed and a press, or a few loose boards for the cattle. The cattle end is about a foot lower than the other end, and in this way they are enabled to leave the whole winter's dung beneath the feet of the cattle, until it is required on the land in spring. Does not this exhibit an instinctive knowledge of chemistry which it would be well for many of our larger farmers to study? In many parts of the country the farm-yard manure is thrown out from the byres from day to day and allowed to collect in a consolidated heap, by which the very richest properties of the dung are almost entirely lost. Contrast this with the care bestowed by the Lewis fisherman-crofter on the preservation of his cows' manure! The furniture is usually very ancient and of rustic appearance, while the sleeping accommodation is limited in the extreme. In consequence of the want of a chimney a dense moving cloud of smoke is continually hanging over the people's heads, and when a stranger enters he is invariably invited to "sit doon oot o' the reek;" if the visitor happens to be a native the gentle command of course is given in the native tongue, Gaelic, which is spoken exclusively among the inhabitants themselves. Only a very few of the crofters keep horses, and their arable land is cultivated almost entirely by the spade, or in some cases by a "Cas-Chrom," a crooked stick shod with iron, which it may be mentioned was the only plough in use at one time, over almost the whole north of Scotland. With a few exceptions the cattle kept by the Lewis crofters are of the Highland breed, while the sheep are a nondescript class. Both are of inferior quality, though a considerable improvement has taken place within the past ten or fifteen years. The shieling system is still extant in

the island, and the crofters' wives and daughters go to the shielings every day in summer to milk the cows and carry food to the herds; and to make the cows stand to be milked they take with them baskets full of fish-bones and sea-weed, which the animals chew away at till they are relieved of their milk. The great extent of pasture in the island enables the crofters to keep more cattle during summer than they can carry on through the winter, and generally by the time the stormy months are past the cattle are very lean in condition, so lean in fact that they often require well-nigh the half of the whole summer to make up for what they lost during winter. The crofters also err in keeping their cows to too long an age. They frequently keep their cows till they are twelve or fifteen years old, and throughout the whole of their lives these animals are fed well during summer and reduced to mere skeletons in winter. This system is undoubtedly a very bad one, but as a class the crofters are slow to adopt new plans, however good they really may be. Of the principles of breeding cattle they have no idea whatever, and though Sir James is laying out large sums of money to improve the breed of cattle, the native crofters are very unwilling to take advantage of these opportunities. Badly as they manage their cattle, the crofters are still less careful in the management of their sheep. No care is taken to select good tups, and from generation to generation they have gone on continually breeding from the same stock. Like the cattle, sheep are fed sparingly in winter, and before pasture can be had outside large numbers of them frequently die solely for want of food. The only outlet for the crofters' cattle and sheep when fed is the Stornoway market, and when killed their sheep usually average about 34 lbs in weight. Poor though many of the sheep be, the average price obtained is now about 6d. per lb. First of all the crofters should be induced to lessen the number of their sheep, and then by the securing of really good tups a great improvement would be effected very speedily. The Lewis crofters eke out the limited revenues of their small holdings from the sea, and when fish are plentiful they earn a considerable amount in a comparatively small space of time. From all sources their incomes are very small, but they are frugal, moderate-living people, and on the whole they live a quiet, contented, comfortable life.

Rotation, Rent, Leases, and Size of Farms.

Rotation.—By far the majority of farmers in both counties pursue a five-shift rotation—1st, turnips and potatoes; 2d, wheat and barley; 3d, hay and grass; 4th, grass; 5th, oats. And there can be no doubt that as a rule this system of cropping is the most suitable for both counties. It is neither too heavy nor too light on the land, and yet it affords facilities for bringing

out of the land the utmost it is capable of producing. On the richer soils, and where abundance of manure is to be had, a four-course shift with only one year's grass is followed, but the area of land suitable for such a trying rotation as this is rather limited. On the lighter land a six-shift rotation is followed—1st, turnips; 2d, barley; 3d, grass; 4th, grass; 5th, grass; 6th, oats and wheat. The extent of land adapted for the growth of beans is very small, but where it is sufficiently strong for this crop a four-course shift is usually pursued, and part of the turnip break set apart for beans. On a few farms a seven-course rotation is adopted chiefly to suit the cultivation of potatoes. In this rotation there are two root crops in the seven years, but potatoes and turnips are so alternated in the break that turnips are never repeated on the same ground without an interval of at least five years. The lighter land is allowed to remain under pasture as long as it retains sufficient grass, and then it is broken up with turnips and laid down again into grass. Of all these systems there are numerous modifications, but these have already been noticed in detailing the farming customs, and need not therefore be repeated here.

Rent.—Half a century ago the large majority of rents were paid in kind, chiefly grain; but in very few cases is this antiquated system still adhered to. On the estate of Balnagown there are still two tenants who pay rents in kind, but when their present leases expire the arrangement will be done away with. With very few exceptions rents are payable at Martinmas and Whitsunday, though under old leases a few tenants pay their rents in three instalments—at Candlemas, Martinmas, and Whitsunday. This ancient arrangement, like the grain rents, will die with the leases under which it now exists. The rental per acre of the arable land varies very considerably; in some parts it does not exceed 10s. per acre, while in the finer districts, such as Nigg, Fearn, Dingwall, &c., it reaches as much as 40s. per acre; on a few farms even four or five shillings more than that. With such an immense stretch of waste land and mountain ranges, an average rental per acre over the whole county of Ross gives no idea whatever of the real value of its arable land. Last year the average value per acre for the whole county, including shootings, but exclusive of fishings, houses, &c., was 2s. 1½d., the highest rented land being in the parish of Fearn, of which parish the average was 15s. per acre, and the lowest in the parish of Lochs in Lewis, where the average per acre was only 7½d. In the Black Isle the arable land varies from 10s. to 35s. per acre, the greater breadth ranging from 25s. to 30s. per acre. In Mid-Ross the larger farms vary from 20s. to 40s., the majority being from 28s. to 35s.; and in Easter Ross the average is a little higher, the extremes being 10s. and 43s. In the parishes of Nigg and Fearn

there are several farms about 40s. and upwards, and yet these holdings cannot be said to be higher rented than many other farms where the average does not exceed 25s. The rental of sheep grazings is not fixed by the acre, but according to the number of sheep the farm is estimated as capable of maintaining. The rate ranges from 3s. to 5s. a head, and the average may safely be put down at 4s.

Leases.—The system of granting leases seems to have been in vogue in Ross and Cromarty at an earlier period than in several other counties in the north of Scotland, and there can be no doubt that these forms of contract were the means of bringing about great improvements in the early agriculture of both counties. On some estates there are a few life-rent leases to original holders, and fifteen or nineteen years to his successor, and leases of twenty-one years' duration, while on others some farms are held under fourteen or fifteen years' leases. A large number of the crofters are simply tenants-at-will, but the great majority of them enjoy leases of ten or twelve years' duration. A few have even nineteen years' leases.

Size of Farms.—The apportionment of the land of a county, or, in other words, the size of its farms and crofts, is a matter of the utmost importance; and in this respect the counties of Ross and Cromarty will stand favourable comparison with most other counties in the north of Scotland. The following table shows the number of holdings of various sizes from 5 acres and under to above 100 acres in extent in both counties:—

Not exceeding 5 acres.	From 5 to 20 acres.	From 20 to 50 acres.	From 50 to 100 acres.	Above 100 acres.	Total.
4510	1189	355	175	286	6515

The percentage of holdings under 20 acres is 87, of farms above 20 and under 100 acres 9, and of farms above 100 acres 4. Ross and Cromarty have double the number of crofts under 5 acres of any other county in Scotland; stand sixth on the list of holdings above 5 and under 20 acres, eleventh of holdings of from 20 to 50 acres, seventeenth of holdings above 50 and under 100 acres, eighteenth of holdings above 100 acres, and second with respect to the total number of holdings, Aberdeen coming first with a total of 11,656.

Steam Cultivation.

Steam cultivation is only in its infancy in these counties, and considering that such a large extent of their arable land is well adapted for cultivation by steam power, and that in other respects their agriculture is so thoroughly abreast of the times, this seems not a little strange. The advantages of steam cultivation are fast becoming known and appreciated all over the country, and the substitution to a large extent of steam engines for horses in the

execution of the work of the farm we regard as the most important improvement in the counties of Ross and Cromarty during the next quarter of a century. Steam power is far as yet from being reduced to its proper simplicity as a cultivator of the soil, but every coming year will bring it nearer and nearer to the point so ardently desired, and by and by we hope to see the steam tackle as indispensable and as popular an agricultural implement (if it may be called such) as the reaper is at the present day. With the view of introducing steam cultivation into Easter Ross, a few proprietors and farmers formed themselves into a sort of an association in 1874 for acquiring a steam tackle; and to raise the necessary capital they assessed themselves at the rate of 10 per cent. on their agricultural rents. A set of Fowler's double engine tackle was purchased, and let by contract to Mr Alexander Bain, an enterprising young man in the district, who already owned two or three portable thrashing mills and engines. The main points in the agreement were that Mr Bain should annually pay 5 per cent. interest, on the capital invested, and a further sum of not less than 5 per cent. in the reduction of the capital; and that when he repaid the whole capital invested, with 5 per cent. interest, the whole plant should be handed over to him without any further charge, the subscribers reserving right, till their capital is repaid, to a preferential use of the tackle on the same conditions as those offered to the general public. Mr Bain began his work under this arrangement in the autumn of 1874, and as yet the system has been found most satisfactory. A few years previous to the formation of this association the Duchess of Sutherland brought a set of Fowler's tackle to the home farm at Tarbat, but not till last year, when she also acquired a set of Fowler's baby double engine tackle, was it used off the home farm. It is now offered for hire when not required at Tarbat House, and finds abundance of employers. About three years ago Captain Grove of Invercharron introduced a set of Fiskens's tackle and worked it on his own farm till last year, when he disposed of it to a company formed for the purpose of hiring it out in the Bonar Bridge district. There is thus at the present time two sets of Fowler's double engine tackle and one set of Fiskens's steam-plough tackle in regular employment in Easter Ross, in addition to four or five thrashing mills and traction engines; and there is every probability of the force being considerably increased before many more years have passed. Almost the whole of Easter Ross is very well adapted for cultivation by steam, and the only drawback is that the high price of coals (usually above 20s. per ton) makes the cost rather high. The district roads and bridges are not very suitable for the shifting about of the tackles, but these small difficulties are fast being overcome. As yet steam power has been employed most largely in preparing the

turnip land, and the plough is used only to a very limited extent. The stubble land is steered by the "digger," or (where there is a hard pan) by the "knifer" in autumn, and allowed to lie exposed to the frosts during winter. In spring it is easily and very efficiently broken up by the cultivator and a double overgoing by steam harrows; and thus little if any horse power is required in preparing the turnip land for drilling. Digging or ploughing by steam to a depth of from 9 to 12 inches costs about L.1 per acre, exclusive of coals and water and attendance, which are equal to an additional 10s. per acre; cultivating with double harrowing costs from 15s. to 17s. per acre, exclusive of coals, water, &c.; and harrowing single tine from 3s. 6d. to 4s. 6d., and double tine from 5s. to 7s. 6d.

Buildings, Roads, Fences, and Drains.

Buildings.—What has been done in the way of building on the various estates during the past twenty-five or thirty years has already been noticed pretty fully, and therefore little remains to be said here. A few general remarks, however, may be added. Probably in no feature of the agriculture of the counties of Ross and Cromarty has there been greater improvement during the past thirty or forty years than in the houses of farmers and crofters. Previous to 1840 houses generally, both on farms and crofts, were of a very primitive description; and during the period that has since elapsed almost every farmstead and dwelling-house has been either built anew, or greatly improved and enlarged. The improvement in the crofters' houses has not been so marked all over both counties, but in the majority of districts, especially on the east coast, these small abodes have been most thoroughly renovated. On several estates a good deal still remains to be done, and in almost all these cases the work is proceeding speedily. We have already referred to the great number of beautiful little properties throughout the county of Ross; and on these, as a rule, the mansion-houses are comparatively new and extremely pleasing in architectural appearance. The grounds and gardens around them have been laid out at great expense, and these picturesque little spots tend greatly to enliven and beautify the landscape. Throughout both counties there are a number of very fine old family seats, surrounded with magnificent ancestral trees and tastefully laid out gardens. During the past twenty-five or thirty years a great many handsome shooting lodges have been erected, chiefly on the west coast and in the glens of the hills of Ross-shire. Most of these are let to sporting tenants, while others are retained as summer residences for their proprietors and their families. The dwelling-houses on the larger farms are of a very superior class, many of them large, handsome, imposing

structures surrounded with beautiful gardens and rich clumps of trees. The smaller farmers, of course, have less pretentious residences, but still they are both comfortable and lively in outward appearance. The supply of labourers' cottages is probably as complete in these counties as in any other county in the kingdom. Many of these cottages are of humble pretensions, but on the other hand a large number are new, commodious, and comfortable. Generally speaking, the farm-steadings are quite suited to the requirements of the advanced system of agriculture now pursued. A large percentage of the farm-steadings is entirely new within the past twenty-five years, while with few exceptions the whole of the others have been enlarged and repaired. The main feature in the improvements on farm buildings within recent years is the increased accommodation provided for the feeding of cattle. Covered courts are quite the order of the day in old as well as new steadings, and on the most of the larger farms court accommodation is indeed very large. Probably over the counties generally the greater number of thrashing mills are driven by water; but still a large number is driven by horses, and in Easter Ross especially the propelling power on many of the larger farms is steam. From a little knoll on Cadboll Mount no fewer than eighteen steam stalks can be counted. Of these several have stood for upwards of twenty-five years, while a few have been erected recently. At the farm of Balmuchy a fine new steam-mill was fitted up by Mr R. G. Morton, Errol, Perthshire, in 1873, and so satisfactorily was it found to work that since then Mr Morton has erected other four on the same principle in the neighbourhood. The mill is fitted up with all the modern appliances for thrashing, dressing, and bruising grain. A special feature is an arrangement for working either of two drums—a comb drum, an easy perfect working piece of machinery, or a common English crush-drum used for preparing thatch. The apparatus for bruising oats or barley and crushing Indian corn is very simple in construction, and can be worked along with the mill without necessitating much additional propelling power. It is not to be supposed, however, that there is no room for improvement in the buildings of the counties. The steadings on a good many of the small farms are rather old and dilapidated, but with the present rate of progress these relics of the past will very soon be numbered among "the things that were."

Roads.—Generally speaking, both Ross and Cromarty are well supplied with roads. In these counties, as in most others in the north of Scotland, a very large sum of money was expended in improving the parliamentary roads and bridges by the commissioners appointed under an enactment of George III. for the re-

pair of Highland roads and bridges. In this way the principal thoroughfares were overhauled and thoroughly repaired, and by local efforts the district roads were also greatly improved. In 1866 an Act was obtained for the maintenance and repair of the roads in both counties—the Ross and Cromarty Roads Act, 1866—the local roads especially having been put into much better order than they had ever been before. An assessment is annually imposed under this Act for the maintenance and repair of the roads and bridges, and that assessment this year is a little over 5d. per pound upon proprietors, feuars, and tenants. Much as has been done in this way of providing local or district and farm accommodation roads during the past twenty-five years, there is still room for improvement in this respect. The value of thoroughly good service roads throughout a farm is undoubtedly of very considerable importance, and over the county generally too little attention has hitherto been bestowed on the subject.

Fences.—Twenty-five or thirty years ago little more than 5 per cent. of the farms of Ross and Cromarty could boast of anything like complete fencing, and probably as many as 70 per cent. were entirely devoid of these modern conveniences. Now there is not a single farm in either county entirely without fencing, and more than three-fourths of the whole are completely enclosed. It is not very easy to calculate the real value of thoroughly efficient fencing to a farm, but where the grazing of cattle or sheep is pursued to any great extent we would not be inclined to put it down at less than 3s. 6d. per acre. The advantages of fencing seem to have been early recognised by the Ross and Cromarty proprietors and tenants, and neither labour nor expense has been spared to make the supply complete. A good many farms, especially in Easter Ross, are enclosed and subdivided with hedges, while others are fenced with dry stone dykes, but wire fences predominate to a very great extent.

Drains.—We believe it is no exaggeration to say that four-fifths of the whole arable area of Ross and Cromarty have been drained, a great extent twice over, within the past thirty or forty years. A good deal of the land was naturally very wet, and consequently it was only after most thorough draining that it was got into anything like a remunerative crop-growing condition. The expenditure on draining alone on some of the larger estates within the past twenty-five years has been enormous, but still there can be no doubt the money was economically expended. For some years back tiles have been extensively used in drains, but in early days stones alone were applied. Even yet where they can be had conveniently stones are used, and in most cases they are found to suit exceedingly well, quite as well as the best tiles that can be had. Like every other variety of labour, draining has

become very much more expensive than even ten or fifteen years ago. The increase since 1850 is about 60 per cent.

Grain Crops.

The following table shows the number of acres under all kinds of grain crops in both counties at various periods since 1854:—

1854,	32,717 $\frac{1}{2}$ acres.	1871,	47,382 acres.
1857,	33,705 $\frac{1}{4}$ „	1873,	47,741 „
1869,	46,746 „	1876,	47,413 „
Increase since 1854,		14,695 $\frac{1}{2}$ acres.	

It will be seen from this table that during the past three years the area under grain crops has decreased by 328 acres, which will be accounted for in our figures relating to permanent pasture. The percentage of grain crops to the total acreage under all kinds of crops, bare fallow and grass, in 1869 was 38·2, and in 1873 it was 38·7, which places these counties seventh in Scotland with regard to the percentage of grain crops, Haddington and Clackmannan coming first with a percentage of about 40 each. With such variety of soil and climate in these counties it is only what might be expected that the grain crop is much more valuable in some districts than in others. Easter Ross is undoubtedly the best grain district; in fact, that division of Ross-shire is well known to be one of the finest grain-producing districts in Scotland. The climate and soil suit the cultivation of grain extremely well, and those natural provisions are fully taken advantage of by the enterprising tenants. Barley is not grown so extensively in Easter Ross as in some other districts, but the acreage under wheat is large, and the yield of this fine variety of grain is usually very good; while for quality and colour the sample has been famed in the southern grain markets for more than fifty years. Speaking generally for both counties, the quality and quantity of the grain crops will bear favourable comparison with any other county in the north of Scotland, and there can be no doubt that within the past twenty-five years very considerable improvement has taken place both in the yield and quality. The work of the harvest is now accomplished in a short period compared to what was required some thirty or forty years ago, when nothing but the antiquated “hook” was used in cutting the grain. On the larger farms in those days from sixty to eighty women and ten or twelve men were employed in the harvest work, and not only was this system a slow one, but it was also more expensive than the mode of harvesting now in vogue. Each of those sixty or eighty women got 30s., and each of the ten or twelve men L.2 for the work of five weeks, and in addition to this sleeping accommodation had to be provided, which in itself entailed a small outlay. All the people now required on these farms are nine or ten women at about L.2, 5s.

and six or seven men at from L.4 to L.5 ; and instead of lasting five or six weeks, as formerly, harvesting operations seldom extend over more than a month, while on several of the farms in the earlier districts three weeks often suffice. In the later parts, of course, harvest generally lasts longer than in the better favoured parts, and in a wet unsteady season, such as 1876, as many as seven weeks occasionally elapse between the cutting of the first sheaves on some farms and the ingathering of the last fragments of the crop. On all the larger farms, and on many of the smaller holdings, reapers are used, while in some cases three or four crofters club together, and purchase a reaper for the cutting of their united crops. Recently a few self-delivery machines have been tried, but the manual deliveries are greatly in the majority. The first reaper was brought to Ross-shire some fourteen or fifteen years ago, and during the past three or four years the importations might be counted by scores. Sowing machines, both drill and broadcast, are employed on the large majority of farms, and when carefully used there can be no doubt that these implements are of great benefit to the farmer. More attention is now being bestowed on the preparing of grain land than some twenty or thirty years ago, and farmers are becoming more and more alive to the influence thorough harrowing has in the success of a grain crop, especially if that crop happens to be barley. During the past few years the top-dressing of all kinds of grain crops has come greatly into vogue, especially in Easter Ross. A few farmers in the Easter Ross district top-dress every acre of grain crop on their holdings, the dose applied generally ranging from 2 to 3 cwts. of bone manure, and nitrate of soda in about equal proportions. Where the climate is good, and the land heavy and rich in silica, top-dressing invariably pays well ; but where the climate is bad, and the land light and scarce of silica, it does very little good. When a very heavy crop of straw is hurriedly forced out of light soft land by such a stimulant as nitrate of soda it is almost certain to lodge. The larger farmers build their grain into stacks varying from 10 to 20 quarters, and smaller tenants into stacks ranging from 5 to 10 quarters. In a wet season in some of the later districts, especially on the west coast, the grain is occasionally built into what are called "Caitness screws," or small loosely built stacks on the fields until more thoroughly dried, and then stacked in the ordinary way. Another prevention from the weather in some of these later parts is the ancient "hooding" system—the placing of two sheaves over the top of the stook in riggin-stone fashion, the heads of the sheaves hanging down over both sides of the stook, and the stubble ends standing right up. This system is a very antiquated one. It was at one time general all over the north of Scotland, but while it keeps out the rain it also

holds out wind, and on the whole it has very little to recommend it. As already stated, there are a good many travelling steam thrashing mills in these counties, and when the markets are inviting large quantities of grain are thrashed early in the season.

Wheat.—The following table shows the acreage in both counties under wheat at various periods since 1854:—

1854,	.	.	.	7527 $\frac{1}{2}$	acres.	|	1871,	.	.	.	8686	acres.
1857,	.	.	.	9715 $\frac{1}{2}$	"	|	1873,	.	.	.	9006	"
1869,	.	.	.	7356	"	|	1876,	.	.	.	6019	"
				Decrease since 1854,	.	.	.	.	.	.	1508 $\frac{1}{2}$	acres.

The price of wheat has been rather low for a few years back, and as a natural consequence the cultivation of it all over Scotland is gradually decreasing. Ross and Cromarty form no exception to this rule; and unless prices brighten up again very soon, the rent of wheat-growing land must necessarily decline. With regard to their acreage under wheat Ross and Cromarty stand fifth in Scotland, and in point of yield and quality they usually rank even a little higher. Over these counties generally wheat yields on an average from 3 $\frac{1}{2}$ to 4 $\frac{1}{2}$ quarters, and weighs from 61 to 63 lbs., the standard selling weight being 62 lbs. In Easter Ross and on the better soils in the Black Isle and Mid Ross the yield usually averages from 4 to 5 quarters, and the weight varies from 62 to 64 lbs. Even as many as 6 and 7 quarters, weighing 64 and 65 lbs., are occasionally grown on some of the richer soils and better managed farms, but these are rare exceptions. It is a curious fact that previous to the advent of the present century the Crown feu-duties in Ross and Cromarty, which were payable chiefly in kind, convertible at the fiars prices of corn, were fixed at two-thirds of the fiars of Fifeshire, and not according to the fiars then struck of the Ross and Cromarty grain. In 1868 the fiars prices in Ross and Cromarty, for wheat, were for first quality, L.2, 8s. 9 $\frac{3}{4}$ d.; for second, L.2, 4s. 10 $\frac{1}{2}$ d.; in 1874 for the whole crop, L.2, 1s. 11d.; and for the seven years from 1868 to 1874, both inclusive, the average was L.2, 8s. 3 $\frac{1}{4}$ d. The highest prices were in 1873 and 1871, when the fiars were respectively L.2, 18s. 3 $\frac{1}{4}$ d. and L.2, 17s. 8 $\frac{1}{2}$ d. The above average for these seven years was exceeded by six Scotch counties, viz.:—Kirkeudbright, L.2, 9s. 11 $\frac{3}{4}$ d.; Haddington, L.2, 9s. 11 $\frac{1}{2}$ d.; Roxburgh, L.2, 9s. 6d.; Berwick, L.2, 9s.; Elgin, L.2, 8s. 9d.; and Nairn, L.2, 8s. 6d. By far the greater portion of the wheat crop is sown in autumn, as soon as the land can be cleared of turnips, or grass when wheat follows pasture, but this system is not pursued so extensively as some fifteen or twenty years ago. When it is sown after grass the land is manured with from 15 to 25 loads of farm-yard manure per acre, and well

broken down by heavy harrows. From 3 to 4 bushels of seed are usually allowed to the acre. The varieties most largely grown are Chedham, white Essex, or white Hunter's, and red wheat.

Barley or Bere.—The following table shows the acreage under barley or bere at various times since 1854 :—

1854,	7550 $\frac{3}{4}$ acres.	1871,	9,125 acres.
1857,	6724 "	1873,	8,741 "
1869,	9370 "	1876,	10,461 "
Increase since 1854,		2910 $\frac{1}{4}$ acres.	

While wheat has been falling in value during the past few years, barley has been increasing at quite a corresponding rate, and therefore it is only natural to expect that the cultivation of barley should be receiving increased attention. The increase in the acreage of barley during the past twenty-two years, it will be seen, is considerably more than equal to the decrease in that of wheat, and at present there is every appearance of barley growing still farther in favour. There is little doubt that for a few years back barley has been the most remunerative of all the grain crops usually grown in this country, and were it not that a good deal of the Ross-shire land is considered unsuited for barley, this variety of grain would be cultivated to a much greater extent than it is. Barley is usually grown after turnips, and when the land is in good heart and well cultivated—a matter of the greatest importance for the success of barley cultivation—the crop is invariably a very good one, not always heavy, but generally rich in grain of the finest quality. Barley will grow to perfection in much lighter soil than is required for wheat, but if the soil is not in a rich manurial state, and thoroughly harrowed and broken down, the crop is seldom a remunerative one. The system, so extensively pursued in Ross and Cromarty of allowing sheep to eat the turnips off the land, is very beneficial to the growth of barley. The manure left on the land by sheep is well known as a sharp valuable fertiliser, and as land after turnips is seldom ploughed to such a depth as stubble land, the barley roots, which, unlike the piercing roots of wheat, spread laterally, can easily command the nourishing ingredients imported to the soil by this manure. A friable medium loam is better suited for the growth of barley than the very heaviest of mould. Ross and Cromarty stand eleventh in Scotland with regard to the acreage under barley. The yield on an average in both counties varies from 4 to 5 quarters per acre, and the weight from 53 to 55 lbs. per bushel. On the better soils the yield ranges from 5 $\frac{1}{2}$ to 6 quarters per acre, and the weight at times reaches 58 lbs. In one or two cases in Easter Ross as many as 8 quarters per acre have been reaped, but a return of more than 6 quarters per acre

is the exception rather than the rule, even in the very finest farms in either county. The fiars prices for barley and bere, in Ross and Cromarty in 1868 and 1874 respectively, were L.2, 0s. 8½d., and L.1, 16s. 9½d.; the average for these and the five intervening years being L.1, 13s. 8½d. This average was exceeded by fifteen other counties in Scotland. Barley sowing usually begins about the middle of April, and from 3 to 3½ bushels are given to each acre. The Chevalier is most largely cultivated, but there is also a good deal of common barley sown. The standard weight of barley is 54 lbs. per bushel.

Oats.—This variety of grain is very extensively grown in Ross and Cromarty. The acreage under oats was in :—

1854,	16,645¼ acres.	1871,	27,540 acres.
1857,	16,256½ „	1873,	28,473 „
1869,	28,806 „	1876,	29,509 „
Increase since 1854,		12,863¾ acres.	

These figures show that the change in the acreage of oats is greater than in that of any of the other varieties of grain, which may be accounted for by the fact that by far the greater portion of the land reclaimed within the past twenty or twenty-five years is what might be called oat land, or land better suited for the growth of oats than of the finer varieties, wheat and barley. Oats will grow fairly with less manuring than any other variety of grain, and therefore by nine-tenths of the crofters they are cultivated almost exclusively. Ross and Cromarty stand seventeenth in Scotland in the acreage under oats, but with regard to the yield they stand much higher up, generally from fifth to tenth, the counties which usually exceed them being Haddington, Ayr, Berwick, Kincardine, Clackmannan, Fife, Forfar, Lanark, and Roxburgh. Oats are grown chiefly after lea, and the best crops are generally reaped when the land is ploughed early in winter, and thus exposed to the ameliorating influence of the winter's frost. The demand for sheep pasture in winter is so great in Ross and Cromarty that farmers are often tempted to allow their lea land to lie unploughed till well into spring, but still winter ploughing is pursued to a very large extent. As is the case with wheat and barley the oat seed is changed from distant counties every four or five years, care being taken not to sow the same grain twice in succession on the same land. The yield of oats ranges from 4 to 6 quarters per acre, and the weight from 41 to 44 lbs. per bushel. On a few of the better farms the yield is sometimes over 6 quarters, but on the other hand very little of what is grown on the crofters' land yields more than 3 to 3½ quarters. The sandy variety prevails, but of recent years several new varieties, such as long fellow, fine fellow, and other similar kinds have been introduced, and are found to suit very well. From 4 to 4½ bushels of oat seed is

generally allowed to each acre. The fiars prices for grain in 1868 and 1874 respectively were L.1, 8s. 0d. and L.1, 6s. 9½d.; the average for these two and the five intervening years being L.1, 5s. 7½d. This average was exceeded by other seven counties in Scotland. Oat sowing begins about the last week of March or first week of April, according to the weather.

Rye, Beans, and Peas.—For many years rye has been grown at considerable breadth in Ross and Cromarty, and of late its cultivation has been extending largely. The area under rye in 1854 was 161¼ acres, in 1869 it was 935 acres, and in 1876, 1192 acres. This variety of grain is sown generally on the drier and lighter land, usually yields from 3 to 4 quarters per acre, and weighs from 56 to 60 lbs. per bushel. The rye straw is mostly used for thatch, and large quantities of the grain are given to feeding cattle in mixture with other stuffs. Sowing commences about the end of March, and cutting about the first week of September. About 4 bushels of seed are given to each acre. Beans require very rich heavy land, and only a comparatively small area in these counties is suited for their cultivation. The area under beans in 1854 was 271¼ acres, in 1869, 67 acres, and in 1876, 86 acres. Peas are now grown more extensively than beans, but of late they have also been declining in favour. The area under peas in 1854 was 561 acres, in 1869, 212 acres, and in 1876, 160 acres.

Hay, Grass, and Permanent Pasture.

Hay and Grass.—The following table shows the area under hay and grass worked in regular rotation at various periods since 1854 :—

1854,	19,641¼ acres.	1871,	29,698 acres.
1857,	20,808¾ ”	1873,	30,360 ”
1869,	28,547 ”	1876,	29,987 ”
Increase since 1854,		10,346¾ acres.	

It will be observed that the area under hay and grass has all along been almost equal in extent to that under oats, both these crops being affected about equally by the reclamation of land. A great deal more attention is now being bestowed on the cultivation of hay and grass than even some ten or fifteen years ago, and considering the greatly increased value now attaching to grass fields, this need not be wondered at. A good supply of grass need not be looked for unless the land is really in high condition, for probably no crop in the rotation affords a more trying test of the manurial state of land than two or three years' grass—and in such counties as Ross and Cromarty a bad crop of grass is indeed a very serious matter. Farmers, therefore (at least the majority of them), pay special attention to the laying down of land into grass, and besides sowing it in a rich manurial

condition, a great many farmers top dress their grass every spring, mostly with 1 cwt. of nitrate of soda and 1 cwt. or $1\frac{1}{2}$ cwt. of dissolved bones per acre. If judiciously applied, top dressing grass might be a little more remunerative than top dressing grain, but still we do not approve of a very heavy dose being given to the young grass the first year, especially if that grass is intended for hay, as by the forcing the plants to too great an extent the first year, the quality and quantity of the grass in after years are considerably degenerated. A very heavy crop of hay is not always the most remunerative to the farmer—at least on moderate land—for if the land is too much exhausted the first year the supply of grass the second year must necessarily be limited. In a word, we approve of top dressing grass-land, but instead of giving a heavy dose the first year, we would give a moderate allowance the first, and a small the second. This system is pursued on several farms, and found to work admirably. About one-third of the grass land is usually retained for hay, and the average yield ranges from 150 to 200 stones per acre. A large quantity of hay is now used in feeding cattle and sheep as well as horses, but on medium-sized farms a considerable portion of this crop is sold off. The quality of the hay and grass in Ross-shire is of the very finest, and in a favourable year cattle thrive exceedingly well on the fields. The large majority of farmers now sow the grass seeds by machines, but a few still commit them to the soil by the hand. It would be impossible to give anything like a correct idea of the mixtures of grass and clover seeds supplied generally in these counties, as almost every farmer sows a mixture of his own. In most cases about a bushel and a half of perennial rye grass, and from 10 to 14 lbs. of various kinds of clover seeds, such as red, white and yellow, alsyke, cow grass, cocksfoot, &c. Mr Mackenzie, Dalmore, sows the following mixture, and finds it to suit very well:—

	lbs. per acre.		lbs. per acre.
Pacey's Perennial rye-grass (1 bushel)	28	Cow grass,	3
Italian rye-grass,	6	Alsyke,	2
English red clover,	2	Timothy,	2
English white clover,	2	Cocksfoot,	2
English yellow clover,	2		—
			49

Permanent Pasture.—With such a great demand for sheep grazing, and with the high price of labour, it is only natural to expect that very much more attention should be bestowed on the laying out of permanent pasture now than fifteen or twenty years ago. Indeed, we are not a little surprised that over the north of Scotland generally the area of land laid out in permanent pasture should be so limited as it is. With an increase in the cost of labour, during the past thirty years, equal to an increased

rental at the rate of about 7s. 6d. per acre, it is difficult to imagine how land worth only 15s. or 17s. of rent per acre can possibly repay regular cultivation. Of land of this description there are many thousands of acres in the northern counties of Scotland that are at present worked in regular rotation, but we should not be in the least surprised though a large portion of this should be laid out in permanent pasture in the course of the next eight or ten years. Under pasture very thin land may pay fairly, but under regular rotation, and so long as the present circumstances continue, we cannot conceive how any man can make a living upon it for any length of time. The area under permanent pasture in Ross and Cromarty has increased by about 2000 acres during the past eight or ten years, and there is every probability of the increase going on still further. The area under permanent pasture at the present time is 19,395 acres.

Root Crops.

Turnips.—The following table shows the number of acres under turnips at various periods since 1854:—

1854,	10,467 acres.	1871,	16,770 acres.
1857,	12,228 "	1873,	16,902 "
1869,	16,735 "	1876,	17,126 "
Increase since 1854,		6,659 acres.	

In 1854 Ross and Cromarty stood seventeenth among the Scotch counties with regard to the acreage under turnips, and now they stand as high up as tenth. Turnips are indispensable where cattle feeding is carried on to any great extent, and it is the extraordinary development of this branch of agriculture in Ross and Cromarty that has swelled the acreage of turnips so greatly. For some time back at least, stock farms have been paying better than grain farms, and so long as this continues to be the case turnips will continue to grow in favour. Over the north of Scotland generally the turnip crop is now one of the most valuable in the rotation, and therefore a great deal of attention is bestowed on its cultivation. Turnips entail a great amount of labour, but still this is neither grudged nor bestowed carelessly. Twenty-five or thirty years ago swedes were little more than in their probationary trial in Ross and Cromarty, and even on the larger farms in Easter Ross it was considered extravagant to sow more than 10 or 12 acres of swedes. In the year 1848 the late Mr Douglas sowed 75 acres of turnips on his farm of Arbol, in the parish of Tarbat, and with the exception of 5 acres of swedes for the farm horses, the whole were soft varieties. Part of the crop was eaten off by sheep at a charge of 2d. a head per week. Now nearly three-fourths of the whole turnip area on the heavier soils in Easter Ross are put under swedes, and on the lighter soils the proportion of swedes to other varieties is about half and half.

There can be no doubt that swedes are the most valuable variety of turnips grown at the present day, but to begin cattle in the autumn a few acres of yellows and globes are quite essential. On the very thinnest of land, yellows suit equally as well as swedes, as the latter variety requires more substantial nourishment than the former to secure a really good crop. Turnips usually follow oats, and in some cases wheat, and as soon as the land can be cleaned of the grain the plough is started. The land is turned over (sometimes by steam as already indicated) to a depth of from 10 to 12 inches, and allowed to lie exposed to the frosts till spring, when it is cross ploughed once or twice, or grubbed two or three times and thoroughly harrowed, and the weeds, if there are any, cleared away. In the earlier parts of the county sowing swedes commences about the first of the second week of May, and from then till the end of June the sole work of the farm is sowing turnips. The land is drilled at a width of from 26 to 29 inches; manured with from 20 to 30 loads of farm-yard manure, and from 4 to 8 cwts. of artificial manure per acre, chiefly bone manure with a little phosphates, and in some cases 1 cwt. or $1\frac{1}{2}$ cwt. nitrate of soda; and sown, if swedes, with about 3 lbs., and if yellows, or whites, $2\frac{1}{2}$ lbs. of seed per acre. The earlier sown portions are generally ready for thinning before the end of June, and for well-nigh a whole month this work goes on incessantly. When very rank the plants are sometimes thinned by the hand, but the hoe is used as a rule. Swedes are left at from 9 to 12 inches apart, and yellows at from 8 to 10 inches. The thinning of turnips is now a very expensive process, and is almost the only branch of farm work that modern genius has done nothing to economise by the adoption of machinery. Several attempts have been made during the past few years to devise turnip-thinning machines, but not one of these has yet reached that state of perfection which is necessary to insure its being extensively employed. During the hoeing process the drills are cleaned two or three times by the drill harrow or "skim plough;" and with this the work of the turnip crop falls out of the farmers' calendar till the arrival of the storing season, which usually commences about the middle of November. The advantages of preserving turnips from the winter's frosts are now fully recognised, and almost the whole crop, except what is to be eaten off the land by sheep, is stored either in pits on the fields, or in heaps around the farm steadings. When wheat follows turnips, which is very often the case, the roots are always driven to the steadings immediately on being pulled, in order to relieve the land for winter sowing. A very large breadth of the turnip break is now eaten off by sheep,—partly off the turnip fields and partly out of boxes on the land. On a good many farms one-half of the yellows and one-third of the swedes are eaten off by

sheep, and when from L.7 to L.9 per acre can be had for this purpose, the system must be regarded as a profitable one. The turnip crop generally over these counties is invariably heavy and of excellent quality. Swedes on an average range from 20 to 28 tons per acre, and on the better farms a yield of 30 tons is considered nothing very unusual. The average of yellows is a little higher than of swedes, and occasionally this variety yields as many as 35 tons per acre. As in the general management of the crops, more care is now bestowed on the selection of turnip seed than formerly, and a good many farmers grow the greater part of their seed on their own farms.

Potatoes.—Potato farming is pursued more extensively all over the north of Scotland now than some fifteen or twenty years ago. The following table shows the area under potatoes in Ross and Cromarty at various periods since 1854 :—

1854,	. . .	5393 $\frac{3}{4}$ acres.	1871,	. . .	10,095 acres.
1857,	. . .	4471 $\frac{1}{2}$ „	1873,	. . .	10,362 „
1869,	. . .	9524 „	1876,	. . .	9,256 „
Increase since 1854,			. . . . . 3862 $\frac{1}{4}$ acres.		

Potato farming has more of the speculative element than the cultivation of any of the other ordinary crops, and therefore it has strong attractions to some. Occasionally it pays exceedingly well, better than any other ordinary crop, but on the other hand it often proves very unremunerative. Disease often destroys more than half the crop, and the prices now and then are very low ; and on an average of say eight or ten years few farmers can boast of a very large return of potatoes. In Easter Ross, in the Black Isle, and in Mid Ross there are a few farmers who plant small fields of potatoes, some going the length of 70 acres, and others only 10 or 12. On some farms they are grown after grass and on others after oats. Medium land suits potatoes better than rich heavy land, and in fact the best crops are often grown on the lightest land. The land is prepared for potatoes much in the same way as for turnips, and while the latter require a very large amount of labour, the former entail a great deal. The lifting of potatoes is a very slow and expensive operation, and when the weather is wet and unsteady the crop is often slightly damaged in the process. About the same quantity of farmyard manure is given to the acre for potatoes as for swedes, but the dose of artificial manure is generally increased a little. The yield of potatoes varies very much, ranging from 4 to 8 tons per acre, according to the condition of the land and the season. The crop in 1876 proved exceptionally good, and as much as L.28 was offered for the acre. In 1875 a large farmer in the Black Isle pocketed about L.1800 for the potatoes grown on a field of 70 acres.

Other Green Crops.—About 20 acres are put under mangold-

wurzel every year, and in a favourable season the crop is generally good. Only from 6 to 8 acres is sown with carrots and from 30 to 40 with cabbage, kohlrabi, and rape, but tares are grown pretty extensively. A great many crofters grow small patches of tares, and on almost every farm there is a little corner of tares for early use among cattle. The acreage under tares in both counties in 1876 was 814 acres, and in 1854 it was 878 acres.

Cattle.

It has already been stated incidentally that Ross and Cromarty are not cattle-breeding, but extensive cattle-feeding counties. In fact there are few counties in Scotland in which so small a number of cattle is bred; and on the other hand in which so much beef is prepared. According to the Board of Trade returns the number of cattle in Ross and Cromarty was in:—

Years.	Cows or Heifers in Milk or in Calf.	Two Years old and upwards.	Under two Years.	Total.
1854,	4,640	7,578	3,632	15,850
1857,	5,110	8,552	3,948	17,610
1869,	16,630	8,025	12,016	36,671
1871,	15,899	7,645	12,110	35,654
1873,	16,599	8,468	15,500	40,567
1876,	16,796	10,080	14,733	41,609
Increase,	12,156	2,502	11,101	25,759

The increase in the number of all kinds of cattle, especially cows and young stock, during the past twenty-two years, as will be seen above, is very great, but when it is mentioned that there are barely three cows to every farm and croft in the two counties, some idea will be had of the small extent at which cattle-breeding is carried on. Probably several hundreds of the smaller crofters keep no cattle, but with this in view it has been calculated that the 461 farms above 50 acres in extent do not average more than ten cows each. The little breeding that is carried on is confined chiefly to holdings under 100 acres and to farms on light land. In fact, it may safely be stated that on eight out of every ten of the farms on the latter class of land only as many cows are kept as are sufficient to supply the farm with milk; and in a few of these cases the calves are sold off as soon as they are able to stand the fatigue of removal. With very few exceptions the cows kept by the crofters are of the Highland breed, and though perfection is yet a long way off, a very decided improvement has taken place in the crofters' cattle within the past quarter of a century. More care is now exercised in the selection of cows, but it is mainly by the use of a better class of bulls that the improvement has been brought about. Several proprietors have very wisely been assisting the crofters on their estates to procure really good bulls, and recognising the benefits that follow

these efforts, the crofters themselves are now manifesting considerable care in the selection of sires. On the smaller of these crofts, where only one cow can be kept, the calf is usually sold off when two or three weeks old or when fostered ; and on the larger crofts the young animals are generally kept till they are stirks, and sold in winter or spring according to the supply of food. No feeding takes place on crofts, but the cows are much more liberally treated with food than some fifteen or twenty years ago. Overstocking has disappeared to a very large extent, but in many cases the cows are still kept to too great an age. It would be greatly for their own benefit if crofters would change their cows much oftener than they do. Though the majority of the crofters rear from Highland bulls, a large number are now availing themselves of the Shorthorn bulls imported by the larger farmers ; and from Highland cows and Shorthorn bulls they are rearing much better cattle than have ever before been seen on their small holdings. Only a very small breadth of turnips is grown among the crofters, and in an open winter the cows and stirks are turned out on the hills and pasture grounds every day. Where breeding is pursued on the farms a very fair class of cows are kept, mostly crosses from Shorthorn bulls and either West Highland, Polled, or Ayrshire cows. Crosses between West Highland and Shorthorn bulls generally turn out well, but we have a decided favour for a cross from a Polled cow. Animals of this latter stamp are growing more and more in favour every day, as might be inferred from the demand that is presently displaying itself for females of the polled breed. Among farmers generally shorthorn bulls are now used almost exclusively, and have been so by a few for more than thirty years. Long prices are frequently paid for sires of this fashionable breed, and there can be no doubt that the money expended in this way is wisely spent. Hitherto the Ross and Cromarty farmers have had to appeal to more southern counties for bulls for their farms, but now they can boast of a fruitful vineyard of their own, of which, however, more anon. On farms where cows are kept solely for the supply of milk, Ayrshires or crosses between Shorthorn bulls and Ayrshire cows, are in the majority, and for the purpose for which they are kept these classes of cows are probably the best to be had.

The question as to whether or not farmers should breed more of their own cattle than they do forms a very important and difficult problem. To discuss it fully would necessitate more space than we have at our command here, and therefore we shall content ourselves with recording our opinion that the farmers of Ross and Cromarty should breed a good many more cattle than they do at present. Undoubtedly there are several farms in these counties unsuited for cattle breeding, partly because the land grows inferior grass, and partly owing to the high rent

which the tenants have to pay; but we are decidedly of opinion that it would be beneficial both for themselves and the country at large, were nine-tenths of the Ross and Cromarty farmers to rear, at least, one-third, probably one-half, of their cattle on their own farms. As already stated, a few do breed about this proportion, some even more, but the general system pursued is to breed as few cattle as possible, and to buy in stirks and two-year-olds from Caithness, Inverness-shire, and elsewhere in the north, and from Irish drovers and feed them off. Cattle feeding is now so important a branch of agriculture in these counties as to merit more than a mere passing notice. But before speaking at length upon it, we must refer briefly to another important system of live-stock farming recently introduced into these counties, viz:—

Shorthorn Breeding.—For many years the most northern herd of shorthorns in Scotland was at the farm of Hillhead in the county of Nairn, but now there are two in Inverness-shire, one in the Black Isle, and two in the county of Caithness. The Inverness-shire herds are at Dochfour and Kirkton, and both are well known for their superior blood and careful management. The Black Isle herd is at the fine farm of Udale, and judging from the foundation that has been laid, it promises to be one of the most valuable herds of shorthorns in the north of Scotland. Mr James Gordon, the enterprising tenant of Udale, reared a very fine class of cross cattle up till 1871, when he began to turn his attention to shorthorn breeding. At a public sale at Huntly, Aberdeenshire, in March 1871, he purchased a handsome dark roan yearling heifer, “Mayflower” after “Prince of Worcester,” and descended from the stock of Mr Bruce, Broadland, Huntly. “Mayflower’s” first calf was “Maid of Ross” by “Grand Duke,” bred at Broadland. Both the mother and daughter are still in the herd and breeding regularly. The daughter, though only four years old, has had no fewer than five calves, having had three at a birth last spring. All the three died, but the other two are still on the farm—“Maid of Ross 2d,” and “Maid of Ross 3d.” Both are by “Ballimore,” bred by Mr Bruce, Newton of Struthers, and now at Rosehaugh. Besides “Maid of Ross 1st,” “Mayflower” has had four calves—two bulls and two heifers, the latter being “Helena” by “Ballimore,” and “Queen of Ross” by “Royal Eden,” bred by Mr Dent, Katerfold Brough, Westmoreland, and out of a cow bred by Mr Linton, Sheriff Hutton, Yorkshire, and after a bull of mostly Booth blood, named “Eden.” “Royal Eden,” who has been a frequent prize taker in England, was bought by Mr Gordon at Birmingham in March 1875. In 1872 Mr Gordon purchased “Clara,” a nice yearling heifer, bred by Mr Cantlie, Keithmore, Dufftown, Banffshire, and after “Argus,” a Dalkeith bull; and her progeny

at Udale is "Rhua Eden," a fine red heifer calf after "Royal Eden." In 1874 he purchased "Beauty," a handsome two year old heifer, bred by Mr Macdonald, Wester Moy, Morayshire, and after "Knight of the Gale," bred at Newton of Struthers and descended from the Hillhead stock. This heifer has bred two bull calves. In the spring of 1875 Mr Gordon purchased "Elsie," a full sister to "Beauty," and she too has bred a bull calf. In March of the same year he bought ten females and a bull ("Royal Eden") at a public sale at Birmingham, and these are all in the herd still. The more noted of these were "Luxury," a thick square cow with good low line, bred by Mr William Howe, Tottington, and after "Heir of Windsor" of pure Booth blood, and closely related to the famous "Royal Windsor;" "Chloris," a richly fleshed red and white cow, bred by Mr John Lynn, Church Farm, Stroxtun, and after "Cambridge Duke" (25,706); "Beeswing" (three years old), bred by Mr Bradburn, Wennesfield, Staffordshire, and after "Surley" (32,635), and tracing back to very famous stock; and "Lady of the Lake" (three years old), bred by Mr Lamb, Abourn Hall, Lincoln, after "Lord of the Manor" (29,178), and tracing back to "Great M'Gull," who won twice at the Royal English Society's Show. "Chloris" produced a fine heifer calf, "Highland Cherry," in September 1875, after "Duke of Cerisia 2d" (33,595), a bull of excellent Bates blood, while the cow herself is of splendid Booth descent. At the dispersion of the herd so long and carefully reared at Orbliston, Morayshire, by the late Mr Geddes, in October 1875, Mr Gordon purchased seven females—four of the well-known "Magnet" family, one of the "Flowery" tribe, one of the "Cherry" tribe, and one of the "Undines." At the dispersion of Mr John Outhwaite's famous herd at Bainesie, Yorkshire, in March 1876, he purchased a very fine roan five year old cow, "Rosebud" by "Royal Windsor," from "Moss Rose" by "Baron Kellerby." She cost 200 guineas, is in calf to "Lord Godolphin," and is a lengthy massive roan with fine style and good shapes and excellent quality. "Miss Danby 2d," a nice yearling by "Royal Windsor," was purchased at the same sale for 80 guineas. At the dispersion of the well-known herd of Mr Robert Bruce, Newton of Struthers, Forres, Morayshire, in October last, Mr Gordon secured no fewer than twelve very good cows and heifers at an average of about 30 guineas. But the most important purchase of all has yet to be recorded. At the Highland and Agricultural Society's Show at Glasgow, in 1875, Mr Gordon paid 400 guineas for "Rosario," undoubtedly one of the finest bulls that ever entered a show-yard. He was bred by Mr Browne, Doxford, Northumberland, after the famous "Duke of Aosto," and has been three times first at the Highland Show—

at Inverness, Glasgow (where his sire and younger brother were also first in their respective classes), and at Aberdeen last summer. He has also been a "Royal" winner in England, and at the Royal Irish Show in 1875 he topped his own class, and beat his illustrious father for the Challenge Cup. The securing of a thoroughly good stock-bull is one of the main points of shorthorn breeding, and the purchasing of "Rosario," to begin with, speaks well for Mr Gordon's judgment and determination in this respect. Twenty-two cows are in calf at Udale to "Rosario" this season (1876). Mr Gordon's herd now numbers in all thirty-four cows and heifers and two bulls ("Rosario" and "Royal Eden"); and forms an interesting and important feature in the agriculture of the counties of Ross and Cromarty.

Cattle Feeding.—It has been calculated that the annual produce of beef and mutton on five farms in Easter Ross is about equal to the amount of beef and mutton consumed in Edinburgh in a month—rather a contrast to those days in which that worthy English lady, previously referred to, had to abandon her residence in Ross-shire because the only description of beef she could find for her table was that of old cows. The Board of Trade returns do not place Ross and Cromarty very high up among other Scotch counties with regard to the number of cattle above two years old, exclusive of cows, or in other words of cattle that have reached the feeding age. But it must be explained that the buying-in system of cattle management so extensively pursued in these counties excludes from these returns many hundreds of animals that are annually fed within their bounds—at least excludes them from the returns referring to Ross and Cromarty. A very common practice among a great many of the Ross and Cromarty farmers is to buy in stirks or two-year-olds about the end of summer or autumn, and feed them off for the February, March, and April markets, and as the Board of Trade returns are not collected till the various crops have been sown, no cognizance can be had of the sojourn in Ross and Cromarty of these buccolic birds of passage. The 10,000 cattle of two years and upwards that are allotted to these counties by the Board of Trade returns do not therefore represent anything like the total number fed off every year. What that total might be no correct idea can be given, but it may very safely be affirmed that Ross-shire is now one of the most extensive cattle-feeding counties in the kingdom. On many small farms of from 100 to 150 acres in extent, from twenty to thirty cattle, and in some cases even forty, are fed off every year; while several farms of from 150 to 200 acres often send in a season very close on 100 animals into the beef markets in the prime condition. To detail the various systems pursued by all these different feeders would be useless, but we shall append a very few notes on the modes adopted by three or four

of the larger farmers, who may be described as the more extensive beef producers. In a word, it may be stated here that the system of feeding most generally followed among the large body of farmers is to tie up the cattle about the end of September, feed them on soft turnips for three weeks or a month, or perhaps a little more, then with swedes, along with straw or hay, and for two months or so before selling off, from 4 to 8 lbs. per day of cake, or cake and a mixture of grain.

Some idea may be had of the expensive system of feeding pursued by a few of the larger farmers, when it is mentioned that they do not consider themselves fairly remunerated for their outlay and trouble in the preparing of their cattle for the market, unless the balance between the buying and selling prices is equal to L.2 a head for every month the animals have been on the farm. Under the ordinary system of cattle-feeding prevailing throughout the north of Scotland generally, about L.1 or L.1, 5s. a month is considered fair remuneration.

Mr Mackenzie, Dalmore, is one of the most extensive feeders of cattle in the north of Scotland. He feeds off every year from 200 to 300 cattle according to his supply of fodder, and usually commands the top prices in the markets. He commences to buy in for the Christmas markets in the spring months, and selects the best two-year-olds (generally crosses) that can be had in the country in the north exclusively. They are fed on grass fields from the first week of May till the middle of August, when about fifty (or about one-half of the lot) of the better animals are housed for preparation for the London Christmas market. For about six weeks they are fed on an equal mixture of cut hay and tares, along with 4 lbs. per day of a feeding mixture with draff and dray from the Dalmore distillery, which adjoins the farm steading. About the end of September the diet is changed by the introduction of a small quantity of white globe turnips and the increasing of the dose of the feeding mixture (to which we shall afterwards refer) from 4 to 6 lbs. per day. The globes are continued for a week or ten days, and then displaced by yellows, for which in about three weeks or a month, or about the end of October, swedes are substituted. From this onwards each animal gets 100 lbs. of swedes per day, along with 6 lbs. of the feeding mixture (which, if necessary, is increased to 9 lbs.); about 12 lbs. of hay, and about a pailful and a half of draff. The first diet is given between five and six o'clock in the morning, and consists of 2 lbs. of the feeding mixture and half a pail of draff to each beast. Shortly after, about 50 lbs. of swedes are allowed, and again at eleven o'clock other 2 lbs. of the feeding mixture, and a half pailful of draff and 12 lbs. of hay are given to each animal, and followed at three o'clock by about 50 lbs. of swedes, and in the evening by another allowance of the feeding

mixture and draff. In this way from forty to fifty fine bullocks are prepared every season for the Smithfield Christmas market, where they usually command prices ranging from L.32 to L.40 a head. The byres emptied by these bullocks are filled up by bought-in two-year-old heifers, and these are fed exactly in the above manner, and sold off as they become ready for the butcher; the stalls thus emptied being filled up by others so long as the supply of turnips and litter lasts. About the end of May "soiling" is commenced with a few heifers, grass being cut and supplied to them in the byres along with 6 lbs. per day of the feeding mixture. By this system, as already stated, Mr Mackenzie feeds off from 200 to 300 cattle every year, according to the supply of the straw—rather extensive feeding for a farm of 370 acres of light land. From 10,000 to 12,000 stones of hay are consumed by feeding cattle every year, and in addition to this, and exclusive of turnips, Mr Mackenzie's annual feeding bill usually amounts to about L.1000, from which it may be calculated that every season he puts double his rent under his turnip crop in the shape of farmyard manure and exclusive of artificial manure. As yet he has found that, by this high scale of feeding, he has done more good to the land than to his own pocket; but he looks forward with confidence to a full return by and by. And certainly such enterprise richly deserves a handsome return. It may be mentioned that the cattle courts at Dalmore are covered, and that some of the cattle are fed in stalls and others in loose boxes. The feeding mixture used by Mr Mackenzie is a very excellent one, and being new, a few particulars regarding it may be read with interest. It consists of the following ingredients, viz., 1 ton of pure linseed, 1 ton of oil-cake (linseed), 1 ton of beans or tares, 1 ton of oats, 1 ton of rye, 1 ton of Indian corn, 1 ton of locust beans, 3 lbs. of common salt. All these stuffs are ground separately, and then thoroughly mixed into one "big batch." The average cost of the mixture for the past four years was from L.9 to L.10 per ton, or about 1d. per pound. For about eighteen months the mixture was used without any linseed, but it was found to heat the cattle too much, and to have a binding effect on their bowels, but since the introduction of the ton of linseed the mixture has done its work admirably. From the following analysis it will be seen that flesh-forming and blood-forming ingredients and bone and muscle producers are combined in the mixture in about their proper proportions. The linseed was added since the mixture was analyzed, and therefore we are unable to give an analysis of it, but it is well known that linseed is very rich in oily ingredients:—

	Linseed Cake.	Beans.	Oats.	Rye.	Indian Corn.	Locust Beans.	Tares, used sometimes instead of Oats.
1.* Aluminous compounds	31·00	24·00	12·75	7·75	8·50	16·75	28·25
2. { Oil,	12·00	3·00	7·90	2·60	4·95	2·35	1·65
{ Starch, sugar, &c., . .	32·08	49·79	55·01	70·61	70·33	59·90	50·00
3. Woody fibre,	7·66	7·76	10·42	3·60	2·22	7·16	4·26
4.† Ash,	5·96	3·20	2·72	1·84	1·60	3·04	2·64
Mixture,	11·20	12·24	11·20	13·60	12·40	10·80	13·20
	100·00	100·00	100·00	100·00	100·00	100·00	100·00
* Containing Nitrogen, .	4·96	3·84	2·04	1·24	1·36	2·68	4·52
† „ Sand,	0·64	0·24	0·88	0·20	0·28	0·24	0·24
1. Flesh formers.			3. Indigestible.				
2. Fat producers.			4. Bone formers.				

At the home farm of Ardross a number of very fine cattle, chiefly crosses from Highland cows and Shorthorn bulls, are both bred and fed, and in fat stock shows they have become quite famous. A very fine red and white bullock, bred and fed at Ardross, won the L.100 prize at Birmingham in 1875 as the best Scot in the hall, and of all the grand animals that left Scotland for the English fat shows last year he was undoubtedly the most meritorious. When at Ardross this fine animal was fed on the mixture used at Dalmore. At Ballintraid Mr Munro feeds close on 100 very fine cattle, mostly crosses picked up in Caithness or elsewhere in the north. He uses a very large quantity of cake and other feeding stuffs. At Farness, Davidston, and Rosefarm, in the Black Isle, occupied by three brothers,—Messrs Thomas, Jonathan, and A. A. Middleton,—a large number of excellent crosses are bought in and fed. At Farness and Davidston, together, upwards of 100 cattle are fed in the house in summer upon hay, cake, and grain.

At the fine farm of Calrossie, in the parish of Nigg, and occupied by Mr John Douglas, feeding is also carried on extensively. In the spring and summer months Mr Douglas generally buys in from 90 to 100 two-year-old cross stots, mostly Caithness cattle, and nearly one-half of these he feeds on cut grass, hay, and cake in covered courts, while the remainder are grazed on the fields till about the end of September, when they are housed for the winter, and fed on turnips, straw and hay, linseed cake, and grain. At first only 2 lbs. of cake are given per day to each animal, but as the market approaches it is gradually increased to 5 lbs., while in addition about the same weight of a mixture of rye, barley, and wheat is allowed during the last six weeks. From thirty to forty are usually in

prime condition for the Christmas markets, and the others are sent off as they become thoroughly fat, their stalls being filled up as opportunity occurs with cattle for the following winter.

Mr Jonathan Middleton, the enterprising tenant of the Clay of Allan, generally feeds every year close on 300 cattle of the best sorts to be had in the north. From one-fourth to one-third of these are "soiled" in covered courts in summer, and sent away at various times during the summer and autumn. Their food in summer consists of a liberal supply of cut grass, hay, tares, cotton and linseed cake, and a mixture of wheat, oats, rye, and Indian corn. The winter-fed cattle are begun on yellows, and after three weeks or a month get abundance of swedes along with cake and meal; and as many as possible are sent away about Christmas.

Mr John Gordon, Balmuchy, is one of the most extensive and most systematic feeders of cattle in Ross-shire. He feeds in all about 130 cattle every year, and his lot for the Smithfield market have for two or three years been among the heaviest and finest lots exposed in that immense mart. He buys in the greater number in February and March—a few being bought in July and August—and selects the best home-bred two-year-olds to be had, taking an Irish beast only when a home-bred animal cannot be had. When bought in the cattle are stalled and fed liberally on swedes, cake, Indian corn, and hay. From thirty to forty of the heavier animals are fed in the house all summer on cut grass, cake, and Indian corn, and the others are sent to the grass about the 3d or 4th of May. From the 12th of August to the 1st of September, according to the supply of grass, they are housed again, and for three weeks they are fed on artificial food and foggage. By about the middle of September yellow turnips are ready for use, and after a short seasoning with these the regular feeding system for the winter begins. About 6 A.M. each animal gets 4 lbs. of a mixture of cake and Indian corn or oats (1 part of cake and 2 of corn), and immediately after a moderate quantity of swedes is given. The byres are cleaned out during this time, and from nine till one o'clock the cattle are allowed to rest. At the latter hour other 4 lbs. of the mixture are given and followed by turnips as in the morning. About six in the evening a little hay is allowed, and at eight Hugh Munro, the experienced and careful cattleman, takes a round among his valuable herd to see that every thing is quiet, but takes care not to disturb the peaceful slumbers of those already "retired to rest." Shortly before the market the mixture of cake and corn is increased by 1 or 2 lbs., according to how the animals are feeding, and how their constitutions are standing out. Mr Gordon's lot of forty bullocks, sent to the Smithfield market last year, ranged in weight from 8 to 12 cwt., the average being about 10 cwt. The

remainder of the cattle fed at Balmuchy range from 6 to 9 cwt. in weight.

At the farms of Cadboll and Cadboll Mount, Mr James Young feeds annually about 160 very fine cattle, all for the southern markets, and pursues a system of buying and feeding similar in the main to that followed by Mr Gordon. Mr Young selects his cattle with great care and taste, and his consignments to the Smithfield market are equalled by very few from north of the Tweed.

Sheep Farming.

Prominent as is the position that Easter Ross has won for the county in an arable-farming point of view, Wester Ross has gained it quite as good a name by the advanced system of sheep-farming pursued among its hills and glens. Not only is sheep-farming carried on very extensively in Ross and Cromarty, but the system of management pursued by the flock-owners will bear favourable comparison with that obtaining in any part of the kingdom. The class of sheep, too, is very excellent; and though bigger-boned animals may be reared on the green-mantled hills in the south of Scotland, more kindly feeding sheep are not to be found anywhere. They are well bred, carefully tended in their youth, and fed with no niggard hand, neither in summer nor winter. These seemingly high-sounding words will probably be appreciated all the more, when it is mentioned that about a hundred years ago sheep-farming, in the true sense of the term, was as little known in Ross-shire as coffee-planting at the present day. It has already been mentioned that Sir John Lockhart Ross of Balnagown was the first to introduce sheep-farming into Ross-shire, and that amidst strong opposition among the natives, amounting even to open revolt, he succeeded in laying a most substantial foundation for a most extensive and highly remunerative branch of rural industry—a branch hitherto entirely unknown in the north of Scotland. For seven years he was the only sheep-farmer in the county of Ross, if not indeed in the whole range of country north of Aberdeen. In 1781 he gave up his farm to a Mr Geddes from Perthshire, who in the face of great opposition from the natives laboured diligently in the good work for many years. At last he succeeded very well, and after his death his son renewed his lease and rented some adjoining lands. Between 1781 and 1790 other three gentlemen began operations as sheep-farmers in Ross and Cromarty on an extensive scale, viz., a Mr Cameron from Fort William, who took a hill farm on Mr Munro's estate of Culcairn; a Mr Mitchell from Ayrshire, who rented a large tract of pasture land on the Tulloch property, and Mr Macleod of Geanies, who leased a large extent of pasture land among the hills on the west coast. Mr Cameron

and Mr Mitchell were thoroughly versed in the business of sheep-farming themselves, and Mr Macleod obtained an experienced shepherd from Perthshire to manage his flock. Despite the extraordinary opposition of the natives already referred to, sheep-farming, by the laudable efforts of these gentlemen, was fairly established in Ross and Cromarty by the advent of the present century. By the introduction of this new industry the population of several glens was considerably reduced, but that sheep-farming has proved an immense benefit to the north of Scotland is too plain a fact to require any discussion here. During the first half of the present century several experienced sheep-farmers from the south of Scotland planted themselves away north among the Ross-shire hills; and in the hands of these and native farmers who became enthusiastic in the movement, sheep-farming developed into huge proportions. For some time black-faced sheep only were bred, but about sixty years ago a good many Cheviots were introduced, and found to suit very well. Among the first to breed Cheviots to any great extent in Ross-shire was the late Mr Walter Mundell, who went north from Dumfriesshire some fifty years ago, and leased the extensive grazing farm of Inverlaul, now held by his son of the same name. Even before Cheviots, Leicester tups were imported, and from these and Cheviot ewes a very superior class of cross lambs, commonly called half-breds, was reared. This system of breeding was found very profitable, and during recent years it has become very general. Sheep-farming extended very rapidly during the first forty or fifty years of the present century, and by about 1860 it had almost reached its height.

The following table shows the number of sheep in Ross and Cromarty at various periods since 1854:—

Years.	One year old and upwards.	Under one year old.	Total.
1854,	...	...	251,619
1857,	...	...	304,444
1869,	280,721	110,067	390,788
1871,	266,171	93,783	359,954
1873,	255,263	104,925	360,188
1876,	260,434	102,546	362,980
Increase since 1854,	.	.	111,361
Decrease since 1869,	.	.	27,808

The decrease during the past seven or eight years is due chiefly to the increased area of hill grazings now under red-deer, but partly also to the fact (to which we may afterwards refer) that several of the farms will not carry so many sheep at the present day as they did some years ago. According to a return in 1857, considerably more than one-third of the total number of sheep in both counties were breeding animals, and since then we are inclined to think the proportion has increased rather than

decreased. Fifteen or twenty years ago Cheviots and half-breds were largely in the majority, and are so still, but during the past eight or ten years the Black-faced breed has been gradually making up upon them. But before summing up the general system of management, we shall offer some details regarding the operations of a few of the larger sheep-farmers, and a very brief sketch of the hills and pasture-lands of both counties.

Sheep-grazings and different Systems of Management.

To make a complete tour throughout the hills of Ross and Cromarty would be no easy matter, for they are very extensive and wild. But imagination is a speedy pedestrian, and our wanderings shall not last long. Starting from the Muir of Ord, on the borders of Inverness-shire, we proceed westward along the course of the Orrin, passing through the highly cultivated and beautifully wooded estates of Highfield, Fairburn, and Muirton; and the first traces of sheep-farming are found in the lower end of Glen Orrin, where there are one or two small stocks of Black-faced sheep. Along the upper reaches of the glen for about twenty miles the land is flattish, black, and heathy, and occupied by red-deer. Passing through the forest we come upon better land, moderately even surface with green pasture and very steep hills, rising on the borders of Inverness-shire to a height of about 3000 feet. On the northern part of this glen the land is blacker and more scant of pasture, and is occupied by Black-faced sheep, while the land on the other side carries deer principally. Continuing our rapid flight, we enter the extensive property of Mr Balfour of Strathconan, which is taken up by a deer forest, several very fine sheep-farms, and a few crofts. It extends from Glen Orrin to the Dingwall and Skye Railway at Strathbran, and runs in three parallel glens, bound in by steep, irregular, rocky hills, partly green and partly black and heath-clad. Adjoining Mr Balfour's estate on the south is Mr Holm's portion of Monar, partly occupied by deer and partly by Black-faced breeding ewes, lambs being reared from these and Leicester tups. The western portion of Monar, called Strathanmore, is one of the finest grazing glens in the county, and contains hundreds of the finest red deer to be seen anywhere. The Cheviot wethers, formerly reared on Strathanmore, invariably topped the market. Continuing about five miles up this glen we come to the water-shed of Loch Alsh, while on the north we have the sources of the Carron and the Meag, this height being also the water-shed between these two rivers. Turning down the Meag we enter Glennaig, where the hills are steep and wild, green on the tops with month (mountain grass), which affords very fine pasture for three months of the year. Near to the base of the hills the surface is very rough, and mostly covered with

heather mixed with green grass ; while on the flat there is a good deal of wet marshy land, with here and there a beautiful green plain, seemingly formed by soil washed from the mountain sides by the rocky torrents that stream into the Meag in such large numbers. Glennaig is on the property of Sir Ivor B. Guest, Bart., of Auchnashellach, and is leased by Mr James Gordon, Udale, who also holds the extensive farms of Corrywick, Camashie, and Glenmeanie, on the estate of Strathconan, and situated further down the course of the Meag. Glenmeanie extends to between 4000 and 5000 acres, and consists of a long narrow glen, with steep rocky hills on either side and level in the bottom ; and on the farm generally the pasture is fair, a large extent being green and partially mixed with heather. The wind blows very fiercely through this narrow trough-shaped glen in winter, and to save the sheep from being blown up by the drifting snow, and to afford them shelter, circular walls about 6 feet high, called "rounds," or "sheep stells," are erected. Glennaig extends to about 10,000 acres and Camashie to about 7000, and Corrywick to upwards of 5000 acres. The latter two together are rented at L.400, Glennaig at L.375, and Glenmeanie at L.300. The best of the pasture land on Glenmeanie is under Cheviot ewes, and the more inferior parts under Black-faced ewes, but Mr Gordon intends increasing his Black-faced stock considerably. Cheviot tups are put to the Cheviot ewes, and Leicester tups to the Black-faced ewes about the 24th of November, and left among them till the end of December, when they are brought back to Udale, the weakest of the Cheviot ewes being drafted out and brought along with the tups, or sent to the arable patches (extending to about 100 acres) on the lower parts of the glen. Lambing commences about the 20th of April, and the lambs are allowed to suckle till about the end of August. The Cheviot wether lambs are sent to a higher farm to be kept for two years, being taken down every year for wintering in the low country about the 1st of October, and sent back to Glennaig about the 1st of April. Camashie is wild and heathy, and here Black-faced ewes only are kept. Corrywick, though surrounded with huge rocky hills, in recesses of which snow lies almost throughout the whole year, has pasture richer and better mixed with green grass, and on the lower and north side of this farm Black-faced ewes are kept, and from these and Leicester tups a superior class of grey-faced lambs are reared ; while on the other parts of Corrywick grey-faced lambs, one-year-olds of the same class, and two year old Cheviot wethers are grazed. The grey-faced two-year-olds are either taken down to the low parts of the county to be fed off by the end of February or beginning of March, or sold off in store condition about the middle of September. The Cheviot wethers here, as generally over the

north, are sold by reputation at the Inverness wool fair for delivery in September. Mr Gordon begins to clip about the 20th of June, and immediately afterwards he dips the wethers in a mixture of his own manufacture, the ewes and lambs being dipped at weaning time. Again, about the middle of November, the whole stock is dipped for the winter.

Between Camashie and the Meag on the south are the farms of Carnock and Scardroy, occupied by Messrs MacIennan, and carrying a fine stock of Cheviot ewes and wethers. Passing down the glen from these farms we reach Mr Balfour's shooting lodge of Dalbreck, the home farm of Strathconnon, and a number of tidy little crofts with neat comfortable-looking cottages. The braes on both sides are covered with thriving plantations of fir and larch, the former predominating. Between this and Scatwell, about six miles further east, there are several small farms covered with Black-faced stocks, the land being black and rocky. On the south side of the Meag, where it joins the Conon, Scatwell House, the residence of Mr Mackenzie of Scatwell, nestles beautifully in a picturesque romantic corner.

Another sheep farm on the Strathconon estate is Cashachan, occupied by Mr John Gordon, Balmuchy, and rented at L.215. This farm lies on the Auchinalt Hill, and in lower parts the pasture is good, while higher up the surface is very steep and rocky. A Cheviot ewe stock is kept here, and the weak ewes and lambs are drafted down to Balmuchy in December and January, and fed on grass for two or three months, and then returned to Cashachan. In addition to this breeding stock Mr Gordon buys in about 600 three-part bred hogs on the 12th of August, and feeds them on Balmuchy on grass, turnips, and cake, sending them, after being clipped, about the 1st of May, to the Edinburgh market. When fat, they usually weigh from 60 to 70 lbs. a head. The Cheviot wether lambs from Cashachan are sold off in August, and the ewe lambs are wintered at Balmuchy and on pasture taken in the neighbourhood. Turning back towards Mr Balfour's home farm we proceed down the Conon, till the fine arable valley of Contin is reached; and just as we enter this valley another extensive sheep farmer comes across our path—Mr Peter Robertson, the enterprising tenant of Achilty.

Mr Robertson has a sheep run of about 1000 acres attached to Achilty; and in addition to this he holds the grazing farms of Garbat, on the Duchess of Sutherland's Strathpeffer property, and of Langwell and Glasstullich on Her Grace's Coigach estate. These farms are far ahead of us yet, but for convenience we shall notice them here. Garbat lies on Ben Wyvis, and on the higher grounds there is good green pasture, but the greater portion of the farm is covered with snow for five or six months of the year. Mr Robertson entered the farm in 1872, and took over at valua-

tion a very fine stock of Cheviot sheep, belonging to the outgoing tenant, Mr Mackenzie of Ord. Mr Robertson considered the elevation of Garbat too high for Cheviot sheep, and accordingly he displaced Mr Mackenzie's stock by a very fine stock of Black-faced ewes. He finds that Black-faced sheep thrive exceedingly well in Garbat, and intends breeding them extensively. He bestows great care on the selection of tups, and as a natural result he is rearing some of the finest tup-lambs to be seen anywhere in the north. His first crop of Black-faced tup lambs was disposed of at a public sale at the Muir of Ord, held by the Northern Counties Pastoral Club, in September last, and the prices ranged from L.3 to L.27. The lambs are dropped on this farm from the 20th to 22d of April, and the ewe lambs are allowed to suckle their mothers up till the 12th or 15th of August, while the tup lambs are left with their dams till the 1st of October. The wether lambs and cast ewe lambs are sold at Inverness Wool Fair, and delivered immediately after being weaned. The better class of ewe lambs is retained for breeding, and are sent to winter in Aberdeenshire in the first week of October. The tup lambs are allowed to remain on the hills till October, and then brought down to Achilty, where they are kept till sold off in the following September. If brought down sooner, their horns would spring so fast on the rich grass, that the flies would interfere with them, and spoil them dreadfully as well as impair the growth of the lambs themselves. The ewes are kept on the lower park of Garbat throughout the whole autumn. Mr Robertson has been well-known as a successful breeder of Black-faced sheep for well nigh a quarter of a century, and on leaving the grazings of Novar at Whitsunday, 1875, he handed over to the Messrs Chutton of London a breeding stock of 3000 Black-faced sheep at the large average (by valuation) of L.2, 5s. a head. Langwell and Glasstullich lie in the parish of Lochbroom, and form a very extensive range of fair pasture, rather mossy and wet, with a vein of limestone—which is said to be traceable all the way north from Ballachulish—running right through it. Mr Robertson got possession of these farms in 1863, and in the first few years he surface-drained a large portion of it, and straightened the water-courses of streamlets by experienced workmen from Wigtownshire. He also got the proprietrix to shift and embank the course of a river for about a mile and a half, at a cost of about L.500, for which he pays interest. He also erected at his own expense from four to five miles of wire fencing, and pays interest on several miles more of march-fences. The stock on these farms consists of Cheviot ewes and wethers, and the system of management is pretty much the same as at Garbat, except that he rears no tups here, and sells no wether lambs. The wether lambs here are sent to wintering in the first

week of October, and a few "Dinmonts" are brought down to Achilty for turnips in the month of December, and in a very severe winter a second draught is sometimes taken down in February, the whole being returned about the middle of March. The tups from the various farms are brought in from the ewes about the 1st of January, and kept on turnips at Achilty until the 12th of April, when they are sent back to the hills. Mr Robertson does not approve of giving turnips to tups during close time, as he thinks it has a tendency to make them soft and lazy. Mr Robertson smears all his old sheep, commencing about the 12th of October, and dips the younger lots. The yeld sheep are clipt from the 15th to the 22d of June, and the ewes shortly after.

Our next route through the hills will be along the Dingwall and Skye Railway. Passing Ben Wyvis on the right and black bare pasture land on the left, we very soon enter the Kinloch-Luichart district; and here on the north side of the Bran some very good grazings are under red deer. To the west of Loch Luichart the Bran is joined by a river which drains the valuable grazing lands of Fannich forest, while on the south of the Bran there is a considerable extent of mixed heath and grass land occupied by sheep. Around Auchinault station there is a beautiful green plain, very inviting for cultivation, but under Cheviot sheep. On the south side of the line lies the extensive sheep-farm of Strath Bran, occupied by Mr George Cruickshank, Ardmore. It extends to about 14,000 acres, is on the estate of Mr Matheson of Ardmoss, and is rented at L.670. Mr Cruickshank keeps a breeding stock of Cheviots here, and takes down the lambs to be wintered at Ardmore. About the upper reaches of the Bran the land becomes blacker, and is occupied chiefly by Black-faced sheep. Passing Auchnasheen, around which there is some very good pasture-land, chiefly under Black-faced sheep, we reach the farm of Ledgowan, tenanted by Mr William Mackenzie, Auchandunie, factor for Mr Matheson of Ardmoss. Ledgowan is also on the Ardmoss property, is very good pasture land, and carries an excellent stock of Cheviot sheep. At the west side of this farm we again reach the watershed, and proceeding on we enter Strathcarron, the property of Sir Ivor B. Guest, Bart., in which strath there is a large extent of fine green pasture. Between Strathcarron and the west coast the hill pasture becomes blacker and the surface more uneven and rocky. Before arriving close upon Strome Ferry the hills are very steep and rocky, and along the side of Loch Carron there are a few irregular patches of arable land, with hill grazings attached, on which a mixture of Black-faced and Cheviot sheep is kept. Passing Strome Ferry we land upon the Lochalsh Hills, which are mostly low and covered with rich

green pasture, with a very little heath intermixed. Crossing at the top of Loch Luig, into which falls the river Luig, we enter a very fine grazing strath, in which are situated the fine farms of Killilan and Blackwater occupied by Mr Brown. We are now in the parish of Kintail, and proceeding up the shore of Loch Duich, on either side of which there are some very fine grazing lands, principally green, but steep and rocky and very grand, we come into full view of Inverniate House, the property of Mr Matheson of Ardross, and beautifully situated on the east side of the loch.

A few miles right inland from this point lies the fine grazing farm of Lienassie, occupied by Mr Alexander Maclellan. It extends to about 14,000 acres, is on the estate of Mr Matheson of Ardross, and is rented at L.815. The farm is steep and mountainous, but the pasture is mostly green and of very fine quality. It is stocked with very fine Cheviot ewes and wethers. Mr Maclellan winters both his ewe and wether hogs in the low lands of Ross-shire, Inverness-shire, and sometimes Aberdeenshire, and also sends away for nearly three months in the winter a considerable number of his "Dinmonts." The remainder of the flock is kept all the year round on Lienassie. In this neighbourhood generally the land is well adapted for Cheviots, but there are now several "hirsels" of Black-faced sheep throughout the district. The large farm of Invershiel, tenanted by Mr Macrae, and stocked principally by Cheviots, lies at the top of Loch Duich, while a little further south is situated Mr Andrew Mitchell's fine farm of Ratagan on the estate of Glenshiel, belonging to Mr Baillie of Dochfour, extending to about 15,000 acres, and rented at L.715. The pasture is a mixture of heath and grass, affording abundance of food in summer, but rather backward in spring, there being no "mossing" or fresh growth till rather late for giving sheep a good start. The hills are very high and rocky, and intersected with rapid running burns, which in wet weather come down very large and are apt to sweep away sheep. The stock is Cheviot sheep, partly ewes and partly wethers, and a few Highland cattle not bred on the farm. Mr Mitchell smears the whole of his sheep, with the exception of a few hogs sent away to lowland winterings, and the process of smearing usually continues for about three weeks from the 6th or 8th of October. The wethers are clipped about the 18th of June, and the ewes about ten days later. The older sheep, with the exception of part of the "Dinmonts," are wintered at Ratagan, and all the wether hogs and about three-fourths of the ewe hogs go to the lowlands for wintering. In very stormy weather the wethers on the high ground have to be taken down to the low ground, which is usually preserved for the ewes, and they are kept there till the snow storm subsides.

The hogs leave for the wintering about the 20th September, and return about the 1st April.

Retracing our steps towards Strome Ferry, and crossing Lochcarron, we enter the far-stretching hills of Applecross, mostly under red deer and crofters. The principal proprietors in this district are Lord Middleton of Applecross, Sir John Stuart of Lochcarron, and Mr David Darroch of Gourock. The extensive estate of Torridon belongs to Mr Darroch, and as in Applecross, it is chiefly occupied by crofters and red deer. Leaving Torridon and proceeding towards Loch Maree, we pass through a considerable stretch of very fair grazing land, and before reaching the loch we find on our right the large grazing farm of Kinlochewe, tenanted by Messrs Elliot & Scott, and stocked with excellent mixed Black-faced, cross, and Cheviot sheep. The land is mostly black and heathy, with here and there a few green patches. On the west side of Loch Maree lies the extensive deer forest of Gairloch, and on the north-east the extensive grazings of Letterewe. Taking a rapid flight over the romantic hills of Lochbroom, we rest for a little at Inverlaul. On the south-west side of Lochbroom lie the extensive conjoined farms of Auchluanachan and Auchindrean, for several years occupied by Major Davidson, yr. of Tulloch. These farms are on the estate of Braemore, and in addition to 500 arable acres they contain 30,000 acres of moderate pasture land. Major Davidson paid a rent of L.1250. Little more than twenty years ago these farms were rented at L.500. On the north-east side of Lochbroom lies the fine farm of Inverlaul, extending to close on 30,000 acres, situated on the Coul property, and rented by Mr Walter Mundell at L.742. The late Mr Walter Mundell, who, as already stated, was one of the first to breed Cheviots extensively in Ross-shire, leased this farm close on fifty years ago, and since then it has been in the possession of the family. Part of the land is good, with abundance of green pasture, but a considerable extent is of little value. In the days of the late Mr Mundell, the Inverlaul Cheviots were famed all over the country, and of recent years there has been no falling off. The stock on the farm consists of Cheviot ewes and wethers, and is managed very much in the manner already described on one or two other farms. Mr Mundell's wethers, when sold at the Inverness Wool Fair for delivery in September, generally bring from L.2, 3s. to L.2, 8s. a head, and the cast ewes from L1, 10s. to L.1, 15s. The large grazing farm of Inverpolly, on the Coigach property, and also in this parish, is leased by Messrs Marshall & Scott, and stocked with very fine breeding Cheviots. They rear a large number of excellent wethers, and buy in a good many more.

Proceeding in a north-easterly direction from Lochbroom, we enter the parish of Kincardine, in which Sir Charles Ross of

Balnagown owns an immense stretch of pasture land. He himself occupies the forest farm, which is valued at L.1000, and on which he keeps a large and very fine breeding stock of Cheviot sheep. The hogs are wintered in Easter Ross, but the others remain all the year round on the forest farm. The pasture is generally pretty good, with several very beautiful green straths, in which limestone exists extensively. Leaving Kincardine and proceeding towards the south-east, we pass through the large and valuable forests of Strath Vaich and Strath Rannoch, with Gleu Diebidale and several other fine grazings on our left; we at last join a welcome friend—the “Iron Horse”—at Garve; and here our hurried notes must end.

General System of Management.

From these necessarily hasty notes it may be gathered that wherever green pasture is plentiful Cheviot sheep are to be found; where the pasture is mixed a few half-breds or three-part bred sheep are reared; and where it becomes more moderate the Black-faced breed prevails. A few farmers have ewe stocks only, and a few wether stocks only, but by far the majority have a mixture of ewes and wethers. As a rule the wethers are kept separate from the ewes and marked off into different “hirsels,” each shepherd having his own distinct mark. Almost all breeding stocks, whether Cheviot, cross, or Black-faced, are managed pretty much on the same broad principles, though in the minutiae of the systems of several of the farmers there may be a little variety. The tups are let loose from the 20th to the 27th of November, and taken in again about the end of December or 1st of January, and from forty to sixty ewes are apportioned to each tup, according to the lie of the land. The lambs thus drop during the last two weeks of April and first week of May, and are allowed to suck their mothers till about the 12th or 15th of August, when they are shifted on to good pasture for a short time. The “shotts” or small ewe lambs, and “cast” or old ewes (about five years), are sold either by reputation at the Inverness Wool Fair, or at the autumn markets at the Muir of Ord. Cast Cheviot ewes usually bring from 25s. to 35s., while shott lambs vary from 8s. to 16s. Black-faced cast ewes sell at from 18s. to 24s., and “shott” lambs from 8s. to 15s.; three-year-old wethers are generally sold at the Inverness Wool Fair for delivery about the month of September; and for those of the Cheviot breed the prices range from 35s. to 48s.; while Black-faced wethers usually bring from 28s. to 37s.; Cheviot wether lambs sell at from 15s. to L.1. Those who keep ewe stocks only, sell off their wether lambs, the cast ewe lambs, and the cast ewes every autumn, and retain the better ewe lambs to recruit their stock of ewes. A good many sheep-farmers hold also arable

farms in the lowlands of the counties, and two or three of these feed their wether lambs for the spring markets, while others utilise their low ground pasture as wintering for their hill stocks ; bringing down the hogs all winter, and sometimes the weakest of the old sheep for a month or two. Those who hold the bleaker and more elevated farms have to remove the greater number both of their old and young sheep during winter, but, generally speaking, the system is to send the hogs away down to wintering to the low lands of Ross and Cromarty, Inverness, Moray, and Aberdeenshire, and to retain the older sheep at home on the lower and better sheltered grounds. Many thousands of the Ross-shire hogs go to Aberdeenshire every winter, and in an ordinary year they come back in good condition. These hogs generally leave home about the 1st of October, and return about the 1st of April. In some cases the ewe hogs only are sent off to wintering, in others the wether hogs alone leave home, while in a few instances part of both. Generally the weaker beasts are shifted to escape the hardships of the stormy months among the higher hills. When the wether hogs return in spring they are generally sent on to the higher lands for the summer months, the lower valleys and straths being retained as ewe ground. Older sheep are generally smeared about the beginning of October, and in some cases also dipped, immediately after being clipped, if wethers, and at the weaning of the lambs, if ewes. The lambs in some cases are dipped at weaning and about the middle of November, and in others, dipped or smeared, generally dipped, about the end of September before leaving for their winter quarters. A few farmers dip the hogs again in February, but this is done only occasionally.

Clipping.—This important part of the sheep-farmer's work commences about the third week of June, and is seldom all accomplished before the end of the month. The collecting of the sheep from the wide mountainous ranges on which they are grazed sometimes occupies several days, and the mustering of labourers for clipping is occasionally a matter of considerable difficulty. All these preliminaries over, however, the work proceeds rapidly. The weight of the fleeces varies very much according to the season and the quality of the pasture on which the sheep are grazed. The following may be taken as pretty near the average :—

Cheviots (smeared.)—Wethers, 6 to 7 lbs. of wool ; Ewes, 4 to 5 lbs. ; Hogs, 5 to 6 lbs.

Cheviots (dipped.)—Wethers, 4 to 6 lbs. of wool ; Ewes, 3 to 3½ lbs. ; Hogs, 3½ to 4 lbs.

Black-faced (smeared.)—Wethers, 5 to 6 lbs. of wool ; Ewes, 3½ to 4½ lbs. ; Hogs, 4 to 5 lbs.

Black-faced (dipped).—Wethers, $3\frac{1}{2}$ to 5 lbs. of wool; Ewes, $2\frac{1}{2}$ to $3\frac{1}{2}$ lbs.; Hoggs, 3 to 4.

Grey-faced Hoggs (dipped), 4 to 5 lbs. of wool.

Rents.—The rent of the Ross and Cromarty grazing farms varies considerably. For the better class of ewe land, or land with abundance of green pasture, as much as 5s. a head is paid for the stock the land is computed as capable of carrying; while for black heathy and highly elevated land 3s. a head is a very general figure. Over both counties the average is probably a little over (certainly not under) 4s. a head; and compared to twenty-five or thirty years ago this shows an increase of fully 1s. a head. A good many ewe farms, *i.e.*, farms adapted for breeding, have been very nearly doubled in rent since 1840, while almost every ewe farm in both counties has been increased at least one-third. Rents of grazing farms are paid in one sum at Martinmas for the year from the Whitsunday preceding to the Whitsunday following the term of payment.

Shepherds.—The large majority of shepherds are married, and live in cottages in the midst of the glens in which they tend their flocks. Some of them have small patches of arable land, and on these they grow potatoes and occasionally a little meal for themselves and their families. The general rate of wages is from L.18 to L.20 a year, with free house, keep for two cows, and from ten to twenty sheep, 7 bolls of meal, and potato land free, or an allowance of potatoes. The unmarried shepherds usually reside with those that are married, and in these cases the married men are allowed to keep three cows, and sometimes have additional allowances otherwise. When away from home with sheep at wintering, their food and lodgings are provided either by their employers, or by those from whom the pasture is taken. Some have no allowance to keep sheep, while others have even larger flocks than what we have mentioned. Shepherds' wages, like those of ploughmen, have nearly doubled since 1850, and during the past few years they have been increasing rapidly. It cannot be said, however, that they are overpaid as yet; they were considerably underpaid a quarter of a century ago. The size of the "hirsell" allotted to a shepherd varies according to the class of sheep and the description of the land. Of breeding stock they range from 400 to 600, and of wethers they are generally a little larger. A few additional shepherds have to be employed to assist in winter.

Profits now and Twenty-five Years ago.

We are inclined to think that sheep-farmers at the present day do not make quite so much profit off their flocks as they did some twenty-five or thirty years ago, though it is pretty generally

recognised as a fact that, of all the varieties of British farming, sheep-farming is still the most remunerative. The agencies at work in the reduction of the sheep-farmer's profits have been many and various, and that reduction, in the case of wether stocks especially, has been very considerable. The farmer who keeps a wether stock only has just the balance between the buying and selling prices, after deducting keep and other expenses and losses, to live on and to pay his rent from. Twenty-five or thirty years ago he paid about 12s. a head for lambs (Cheviots) and L1. for hoggs, and sold them as three-year-old wethers at about 36s. a head. Now he pays about L1. for lambs and 30s. for hoggs, and obtains 45s. or 46s. a head for three-year-old wethers. It will thus be seen that the buying and selling prices have stood in almost the same relation to each other during the past quarter of a century. But not so with the expenditure between the day of purchase and the day of sale. Wintering has been doubled, shepherds' wages nearly so, smearing and dipping expenses increased, and losses also very largely increased. Even during the past ten years wintering has increased nearly 100 per cent. During the six years from 1863 to 1868 one of the largest sheep-farmers in Ross-shire informed us that his average for wintering his black-faced hoggs in Aberdeenshire was 3s. 6d. a head, and that now he pays exactly double. When the wintering is very good, or a little turnips added, the average cost is never under 7s. 6d. a head. And again, by some unknown cause, the losses from death are heavier now than formerly, while a greater number have invariably to be noted in the shepherd's day-book as "unaccountable." As a rule, of every twenty wether lambs bought in August, or sent away to wintering, only fourteen or fifteen remain for sale as three year wethers; and by the increased price that is paid for it and the expenses laid out upon it, every hogg or wether that dies or goes amissing now is nearly equal to the loss of two some thirty years ago. To make up for all this increased expenditure and losses, farmers have to depend mainly on the crop and sale of wool, which in fact may be said to regulate almost entirely the profits of a wether farmer. Though the "clip" is usually heavier now than thirty years ago, and the prices for wool occasionally higher, the latter are frequently even lower; and taking everything into account, we are of opinion that no more rent can be afforded for wether land now, with mutton at 9d. per pound, than when it was selling at about 4d. Breeding stocks pay considerably better now than previous to 1850, and chiefly on this account we anticipate a large and speedy increase in the number of Black-faced sheep in these counties as compared with that of Cheviots, for it is well known that where only wethers of the Cheviot breed can be kept, a breeding stock of Black-faced

sheep would thrive admirably. But still we do not think that the increase in the profits from breeding stocks have quite kept pace with the advance in the rent of ewe land, and consequently the owners of breeding as well as of wether stocks, have to be contented with a balance of slightly smaller proportions now than some twenty-five or thirty years ago.

It is not alone of increased rent, wintering, and other expenditure that Ross and Cromarty sheep-farmers complain; some of them are beginning to find that their farms will not carry so many sheep, or keep them in so high condition, as fifteen or twenty years ago. Considerable portions of the grazings are becoming foggy and rough and of little value as sheep pasture. We could point to one or two hirsels which carried stocks of from 1000 to 1100 over winter some twenty years ago, and which will now winter scarcely 800. The cause of this, we believe, is the covering of the land for so long a period exclusively by sheep, without any Highland cattle being allowed upon it, as was the case before sheep-farming reached its height. An experienced sheep-farmer says, "The land is getting tired of sheep, and is needing to be cropped, and thereby sweetened, by Highland cattle;" and we have not the least doubt but the pasture would be considerably improved by being overrun by Highland cattle for a few years. The present holders probably could not afford to try this experiment without the co-operation and assistance of their landlords; but we think that on several farms a few cattle might be kept without lessening the stock of sheep to any appreciable extent. Two or three farmers, in fact, have recently been adopting this plan, and are finding that it is likely to have beneficial results. Some farmers think that if those parts of grazings that have become foggy were inclosed for two or three years, and the grass allowed to rot on the ground, the fog would thereby be destroyed, and the grass-producing qualities of the soil revived. We certainly think some scheme ought to be tried.

Pure Bred Leicesters.

The Ross and Cromarty sheep-farmers are very careful in the selection of tups, and every year large numbers are introduced at heavy outlay from the finest stocks throughout the country. The large majority rear a certain proportion of their own Cheviot and Black-faced tups, but the breeding of Leicester tups is confined to a very few. Mr Hosack, Docharty, Dingwall, has reared a few very good tups of this breed for upwards of twenty years, and finds a ready sale for his annual crop among the farmers of the county. Mr Hosack began with Blainslie ewes and a Polwarth tup, and has all along been rearing from the original stock of ewes and strong well-bred Border Leicester tups purchased at high prices. He has now

about seventy ewes on his farm. Mr Gordon, Udale, has been rearing a few very fine Leicester tups, for five or six years, mostly for his own use, though of late a small number have been offered for sale. The nucleus of his stock came off the stock of the Rev. Mr Bosanquet, Rock, while about four years ago he introduced about forty ewes and gimmers from Marvingston. The tups used at first were purchased from Mr Lees, and latterly from the Messrs Clark, the top prices being always paid for these tups. There are now about 100 ewes at Udale. Mr Munro, Ord, also breeds a few; while Captain Warrand, Ryefield, reared a good many for several years, but dispersed his stock in September last.

Horses.

The following table shows the number of horses in both counties at various periods since 1854 :—

1854,	.	.	3975		1871,	.	.	6594
1857,	.	.	4759		1873,	.	.	6743
1870,	.	.	6681		1876,	.	.	7099
Increase since 1854,			.	.	.	.	.	3124.

Of the number of horses returned this year about 5300 are employed in agriculture exclusively, while about 1700 are either mares kept solely for breeding purposes, or young animals not yet trained to work. The increase of this latter class during the past five or six years is close on 70 per cent., and this no doubt is due to the enormously high prices which have been current for farm-horses for a few years back. These exorbitant prices have turned almost every farmer to the breeding of horses for himself, and we believe there is a larger number of foals and young horses throughout the county at the present day than there has ever been at any former period in the history of agriculture. This must inevitably bring farm horses nearer to their proper value than they have been for some time, and indeed in most counties they are beginning to decline already. The farm horses generally throughout Ross and Cromarty have been improved very much during the past quarter of a century, chiefly by the action of Farmers' Clubs and landed proprietors in bringing in improved stallions; but still they are far from what might be desired. They are rather light and leggy, with too little of the real Clydesdale stamp about them; and it is by the introduction of the best Clydesdale stallions to be had that the desired improvement is most likely to be effected. Some farmers seem to cling to light leggy horses because they go at a smart pace in the reaper; but this advantage, if it is such, is surely more than counterbalanced by the shortcoming of these animals at the heavier work of the farm. Farm-horses are usually worked pretty steadily, but they are also well fed and well cared for otherwise. From 60 to 80 acres of land—in a few

cases where the land is light and level, even as much as 100 acres—are allotted to each pair of horses. Ponies are very numerous among the crofters; and among the farmers generally there is a very excellent class of gig and saddle ponies from twelve to sixteen hands high.

Swine, Poultry, and Markets.

Swine.—Swine do not get that care and attention which they really deserve. They ought to be kept in much greater numbers, and fed and housed better than they are in most cases. These remarks apply very generally to the whole north of Scotland. The number of pigs in Ross and Cromarty was, in

1854,	.	.	4583	|	1871,	.	.	6980
1857,	.	.	4568	|	1873,	.	.	5898
1869,	.	.	4664	|	1876,	.	.	6535
Increase since 1854,			.	.	.	.	.	1952.

Considering that there are so many crofters in these counties, it seems rather strange that so few swine should be kept. Recently several farmers have been feeding a good many, and taking this into account we do not think that many more than one-half of the crofters keep swine at all. Those that are reared among the crofters are of a mixed and rather inferior breed.

Poultry.—Poultry-farming is not practised to any great extent, except by some of the landed proprietors and on a few large farms.

Markets.—Ross and Cromarty are well supplied with cattle, sheep, and horse markets. The most important of the lot is the Muir of Ord market, the stance of which is close upon the borders of Inverness-shire. This market, in fact, has been the most important sheep fair in the north of Scotland for many years, while it is also attended by large droves of Highland cattle, Caithness crosses, and Irish cattle. It is held every month all the year round, excepting April, for cattle; in all the months excepting January, February, and December for sheep, and excepting January, February, April, and December for horses. Cattle-markets are also held monthly at Kildary and Fortrose, and occasionally at Alness Bridge, Dingwall, Invergordon, &c., while sheep markets are held at Coigach and elsewhere. Weekly grain markets take place at Dingwall, Tain, Cromarty, and Fortrose.

Labour.

It has already been stated that Ross and Cromarty are particularly well supplied with labourers' cottages, better, in fact, than most other counties in the kingdom. And we cannot help regarding this as one of the most satisfactory and pleasing features in the agriculture of these counties. The scarcity of

farm labourers throughout the country is gradually becoming more and more serious, and while so little is done in so many counties to provide for these labourers—what is put within the reach of every other class of the community—a home of his own and the prospects of a comfortable married life, can it be wondered at that men of spirit and enterprise would refuse to remain plodding at the horse's head, while there are other (and to him seemingly better) fields open? Give the farm-labourers cottages, and the prospects of some day having what they might call a home of their own, and less will be heard of emigration and the limited supply in the labour market. Ross and Cromarty provide these most reasonable comforts for their farm-labourers, and as a natural consequence those "anxieties, doubts, and fears," manifested among agriculturists in other parts of the country have never yet disturbed the social atmosphere of these counties. There are very few "bothies," only one here and there, and the unmarried servants (little more than a third of the whole) either live with married men or in the farmer's kitchen. There are no feeing markets, and engagements are usually made from year to year through register offices, or quietly in a private way between the farmers and the servants themselves. Men's wages have advanced from 60 to 80 per cent. since 1850, and women's about 120 per cent. Ploughmen generally receive for the twelvemonths from L.15 to L.18, with from 8 to 11 bolls of oatmeal, 6 bolls potatoes, and in some cases a few hundred yards of "harvest" potatoes; 1 pint of milk in summer and $\frac{1}{2}$ pint in winter, free cottage and garden, with allowance to keep a pig and a few hens, and about $2\frac{1}{2}$ tons of coals. Labourers get from 12s. to 18s. a week, with free house and garden, and women about 1s. a day, with potato land and some coals; and in harvest 1s. 8d. a day. Harvest hands, when not resident on the farm, are usually employed for a month at wages slightly higher than the above rates.

Subordinate Industries.

So much space has already been taken up with the subject proper of this report that only a sentence or two can be added regarding the subordinate industries. Excepting the fishing they are not of very great importance. There are three fishing districts, Stornoway, Lochbroom, and Cromarty, and along with Skye, Lochcarron forms another. In 1874 the number of boats at Stornoway was 1045; the number of fishermen and boys employed, 3959; the number of fish-curers, 40; of coopers, 70; the value of boats, L.20,337; the value of nets, L.23,814; the value of lines, L.11,314, and the total estimated value, L.55,465. At Lochbroom in the same year the number of boats was 656; of fishermen and boys employed, 2815; of fish curers, 10; of coopers, 4; the value

of boats, L.8451; of nets, L.18,360; of lines, L.2548; and the total value, L.29,359. At Cromarty the number of boats was 292; of fishermen and boys, 955; of curers, 8; of coopers, 28; the value of boats, L.6998; of nets, L.12,512; of lines, L.2027, and the total value, L.21,537. At Lochcarron and Skye (in Inverness-shire) the number of boats was 695; of fishermen and boys, 2067; of curers, 37; of coopers, 13; the value of boats, L.6996; of nets, L.16,932; of lines, L.2235, and the total value, L.26,163. The number of barrels of herring cured or salted at these districts in the same year was:—Stornoway, 75,471 $\frac{1}{4}$; Lochbroom, 3070; Cromarty, 2388; and Lochcarron and Skye, 17,932. The number of cod, or ling, or skate, taken was:—Stornoway, 325,141; Lochbroom, 43,880; Cromarty, 14,471, and Lochcarron and Skye, 15,180.

There are five distilleries—Dalmore, Teaninich, Ord, Glenmoragie, and Balblair. Between 10,000 and 12,000 quarters of barley are distilled at these five establishments every year, the consumpt of Dalmore itself varying from 5000 to 6000 quarters.

ON THE *TAXODIUM SEMPERVIRENS* (OR RED WOOD) FOR
TIMBER PURPOSES.

By ROBERT HUTCHISON, of Carlowie, Kirkliston.

[Premium—The Medium Gold Medal.]

Taxodium sempervirens (Lambert), the Redwood or Bastard Cedar.

Synonyms.—*Sequoia sempervirens*, Endlicher.

„ *Taxodium nutkaense*, Lambert.

„ *Schubertia sempervirens*, Spach.

„ *Condyllocarpus sempervirens*, Salisbury.

Leaves.—Mostly in twos, but sometimes in threes, on the lateral branches and branchlets, linear, ovate-lanceolate, obtuse at the ends, very slightly convex, and of a pale green colour on the under side, but considerably darker and shining on the upper. From half an inch to an inch long, but smaller when young; those on the young shoots of the terminal point, distant and very acute.

Branches.—Spreading and horizontal, irregularly placed alternately along the stem, rather distant, and sprouting out numerous lateral ones in two rows, those nearest the trunk generally drooping, while, towards the shoots of young wood, at the extremity of lateral branches, they are not uncommonly elevated in graceful sweeping curves.

Branchlets.—Numerous, in two rows, and bent downwards.

Flowers.—Monœcious, or male and female separate; but on the same plant solitary and terminal; male flowers globular, on slender footstalks, and densely covered with very minute scale-like leaves.

Cones.—Small, sub-globular, or obtuse-oval and ligneous, solitary, terminal, and about an inch in length.

Scales.—Numerous, wedge-shaped, irregular in shape, rugged and wrinkled on upper edge, hollow in the middle, and furnished at the point with a sharp horn-shaped blunt apex pointed outwards.

Seeds.—Irregularly shaped, woody, and three to five at the base of each scale, and winged.

Habitats.—California and North-West America.

There can be no doubt of the close generic relationship between this magnificent pine, *Taxodium* or *Sequoia sempervirens*, and the well-known *Wellingtonia*, or *Sequoia gigantea*, as it is frequently called on the other side of the Atlantic, although there has been considerable controversy between botanists as to whether both pines are not members of the same genus, and as to the distinctness of each. Dr Lindley's arguments against the proposition of community of genus subsisting between them, have been resolutely opposed by those of Professor Asa Gray, Decaisne, and others; and indeed at first, when the *Taxodium sempervirens* had been only recently introduced to general notice in this country, it was matter of much speculation as to the real botanical differences existing between the *Wellingtonia gigantea* and *Taxodium sempervirens*, for as yet botanists had only the foliage and the cones sent from abroad to guide them, no male flowers having been produced in this country. These, however, were first observed in England in 1866, and appeared identical in structure and form in both conifers; a slight difference only existed in the size. The principal distinction, therefore, seems to be in the foliage; the spines or leaves of *Taxodium sempervirens* being distichously spread out like those of our common silver fir (*Picea pectinata*), or like those of the true *Taxus* genus; whereas the leaves of *Wellingtonia gigantea* have an imbricated, scale-like appearance, resembling rather the foliage of the juniper family than that of the *Sequoia*; and even after they have attained full development they retain a distinct sessile habit, without any tendency to present a flat laminate surface-form. It should, however, be stated that, although from the distinctness in the structure of the foliage mainly can any difference in genus be traced between these closely allied coniferous giants, there is a specimen in the British Museum of a small branch of *Taxodium sempervirens* which presents distinctly *imbricated leaves*, all along its growth, except at the very points of the young branchlets; and these imbricated leaves are of the same shape, size, and general appearance as those of *Wellingtonia gigantea*. No instances have been recorded, or have come under our observation, where the converse has occurred, or where the leaves or spines of *Wellingtonia* have assumed the distichous, laminate habit of the *Taxodium*. Dr Cooper,* however, reports that, at San Diego in 1864, he found some trees of peculiar appearance, the foliage being, he believed, intermediate between *Wellingtonia gigantea*

* *Travaux de la Commission Géologique de Californie*.

and *Taxodium sempervirens*. But as in no other instance have we any record of this peculiarity having been observed by other travellers, it was probably due to some special cause, whether of locality, soil, or other physical conformation of site, and must not be taken as proving the identity of the two conifers conclusively, but as a very significant fact, which, if supported by more evidence of a similar nature from other localities beyond the immediate radius of the original habitat of the Wellingtonia, may prove of much value in solving the disputed point of identity in the botanical sense of the term.

The cones differ somewhat in size and compactness, those of the Wellingtonia being rather larger, and more compact in texture. In the bark and timber again, the difference is very slight. In the Wellingtonia, the former is thicker than in the case of the Taxodium, while the timber is said to be lighter; but the general character of both, in point of texture, grain, and colour, is the same. Both woods also abound in another essential element of comparison when identity or community of genus is being considered. We refer to the red colouring matter (soluble in water), with which the timber of both these pines has been found to be largely diffused; and from this peculiar characteristic, the name of "red wood" has been given to the *Taxodium sempervirens*. The geographical area occupied by the Taxodium is much wider than that of the Wellingtonia; hence, though at first probably the same plant identically, by wider diffusion of habitat, change of soil, climate, altitude, &c., the *Taxodium sempervirens* may have, by such successive and continuous alternations, acquired a slightly altered character of foliage or otherwise, not sufficient, however, to justify us in supporting Dr Lindley's theory of its being entitled to be regarded as a distinct genus. The giant survivors of the Mariposa Grove, and other special localities in California, where individual groups of the *Wellingtonia gigantea* are still found, probably present to us the old "aborigines" of the Sequoia type, while the wider distribution of *Taxodium sempervirens* present to us the same individual (or at most, a variety thereof), modified by geological changes or climatic influences. The two are clearly, then, *congeners*, or allies, as intimately related as are the *Pinus sylvestris* and *Pinus Pinaster*, or the now generally accepted single family of *Cedrus Libani*, *Deodara*, and *Atlantica*; and probably a fair compromise to this controversy regarding the nomenclature, would be to accept both as of genus SEQUOIA the one being differenced as *Sequoia Wellingtonia*, and the other as *Sequoia sempervirens*. This view has been favourably entertained by Dr Seemann and other distinguished botanists.

The *Taxodium* (or *Sequoia*) *sempervirens*, is found to occupy as its native habitats, the north-western coast of America, where it was first observed by Menzies in 1796, and it has since been

found over a wider area, growing in abundance on the mountains of Santa Cruz, and indeed all over Upper California. One of the first discoverers who introduced the *Taxodium sempervirens* to this country was the lamented Douglas, who in 1836 forwarded seeds of it to Britain; but it must be admitted that the late Dr Fischer was the first who sent the tree in a living state to Europe, having in 1843 transmitted to St Petersburg young plants of *Taxodium*, as well as a substantial certificate of his opinion of the prospective value of the plants as timber-yielding trees, in the shape of a transverse section of an old trunk, which measured above fifteen feet in diameter, and indicated as its age, 1008 annular rings. This section was not sent from Californian habitats, but from the provinces further to the north-west, where this conifer abounds in quantity, and where it is frequently seen upwards of 200 feet in height, with a trunk in many instances measuring over fifty feet in circumference, and with a clear bole of fully seventy feet. Although so well-suited to the north-western seaboard of America, the mildest winters of the Middle States almost invariably prove too severe for its existence in those quarters; but in its native continent, where the *Taxodium sempervirens* does thrive, it makes amazingly rapid annual growths, and is an unusually handsome and striking acquisition to the landscape. Douglas, writing of this conifer in 1836, when all the freshness of novelty and discovery were foremost in his thoughts, says in a letter, which is published in "Hooker's Companion to Botanical Magazine," vol. ii. p. 150:—"The great beauty of Californian vegetation is a species of *Taxodium*, which gives the mountains a most peculiar, I was almost going to say, awful appearance, something which plainly tells us we are not in Europe;"—may we hope that by the successful and extensive introduction of this pine into our own country, such picturesque grandeur and sublimity of the Western landscape may in future ages be reproduced on this side of the Atlantic!

Since its introduction into Britain, the *Taxodium sempervirens* has been very generally planted in all situations, soils, and altitudes; but has neither been so extensively adopted, nor so favourably received into public favour, as the *Wellingtonia gigantea*. One great prejudice against it, is its very frequent liability to become injured by the early spring frosty winds, which are so peculiar to our climate, and which—although, in the whole course of our extended investigations regarding this pine, we have been unable to find any instance of their having inflicted *fatal* injuries—do undoubtedly so severely affect the foliage, as to render the tree for the earlier months of summer a most unpromising specimen in many localities and situations. In common with the *Wellingtonia*, it acquires a singed and burnt appearance, but its leaves become more brown, and are shed to an extent

which the Wellingtonia rarely experiences in our climate; and the effects of the weather in severe seasons are in this country apparent upon the Taxodium, long after they have been thrown off and have disappeared from the Wellingtonia, planted in the same situations. Notwithstanding, however, this inaptitude for throwing off quickly the effects of the frosty winds of March and April in our latitude, the Taxodium, if left to itself, ultimately recovers, and time may, by and bye, further inure the constitution of the tree to these vicissitudes of spring. Meantime there can be no doubt that this susceptibility of injury has greatly deterred the extensive introduction of the Taxodium into Britain, and has materially prevented planters from using it in quantity, either as a nurse, or as a forest tree for future profit. This is, however, to be considered as matter of regret; for notwithstanding the liability to suffer from spring winds in this country, the *Taxodium sempervirens* is so tenacious of life, that in several instances, where it has been recorded, during the severity of such winters as 1860-61, or 1867, as having been killed back to the very stem, it has always recovered; and its peculiar facility of sending out young branchlets from the main stem, and from the back of the larger branches, enables the tree to recover its lost ground in a short time. The thick, spongy nature of its bark is of much use to the plant in such a case, by protecting the alburnum and young wood from the intensity of the cold, and so fostering the habit of forming and pushing forth young branch-sprouts, when the exigencies of nature require them, from the trunk or necks of the branches, for which this conifer is so remarkable. Instances of the hardihood of the *Taxodium sempervirens* in this country, and of its capability to withstand extreme temperatures and severe seasons, are numerous. Thus, for example, in the memorable winter's frost of 1860-61, at Belstane, 900 feet above sea-level, and with the thermometer indicating 28° of frost, some of the specimens were slightly injured, while others growing there, but in a more northerly exposure, were unscathed; and in this locality all the Wellingtonias were more or less severely affected. On the other hand, at Twizell, where exposed to the sun and wind during the same season, with the thermometer registering 8° , the plants were a good deal injured, while the Wellingtonia escaped; and in the Bangholm Nurseries, near Edinburgh, where the most intense frost of that winter was 6° , the *Taxodium sempervirens* were very slightly injured, and the plants of Wellingtonia entirely escaped. The soil is well drained, and the plants in both instances were fully exposed, and planted within half a mile of the sea. The probable cause of the greater immunity enjoyed by the Wellingtonia, may have been the greater quantity of snow retained as a covering on their young shoots, arising from their denser foliage presenting a better surface to catch and hold

the friendly mantle, and also from their having been less exposed to the wind than the plants of *Taxodium sempervirens* had been during the storm. In the farther north, as for instance in Aberdeenshire, Morayshire, and Inverness, it has proved itself quite hardy; but it appears to thrive best on the west coast of Scotland, owing to the greater moisture in the atmosphere, and freedom from easterly winds.

In regard to soil in Great Britain, the *Taxodium* will be found succeeding best in good loam of a deep nature, and with a damp and cool subsoil. Indeed, in such soils as the *Wellingtonia* thrives and delights in, this pine, which is so similar in habit of growth, will be seen to produce most satisfactory results. It is not, however, averse to any particular kind of soil, as there is none, so far as has been ascertained, in which, in this country, it will not live, provided other material requisites, such as exposure to the north, so as to avoid the sun's rays in winter and spring, cool substratum, &c., be present. At Gordon Castle, in Morayshire, in the same winter, those plants which occupied low lying situations in a light soil were killed, while it survived when placed on a dry, airy site, in light soil, resting on old red sandstone rock; but upon the whole, even there, in favourable sites, considering the confirmation of the locality, the *Taxodium* cannot be said to be a very rapid growing or luxuriant tree. At Dupplin Castle, in Perthshire, it thrives admirably in a good loam, 2½ feet deep, resting on a sandstone rock bottom of great depth, and in this situation it appears to enjoy the coolness of the substratum, and its roots are clinging firmly to, and running healthily along the rocky subsoil, which suits them well. The best specimen there is now 48 feet in height, and 4 feet 10 inches in girth, at 1 foot from the ground. At Durris, Aberdeenshire, the *Taxodium sempervirens* thrives admirably. In a good dry soil resting upon granite rock and gravel, it cones freely every year. The best specimens are now about 35 feet in height, and in girth, at 3 feet from the ground, are above 2 feet. They are situated in somewhat sheltered positions, and have his season (1876) made growths of over 2 feet in length. There have been no complaints of the spring winds having injured the foliage in this locality; probably owing to the shelter afforded by the dense foliage of the surrounding conifers in the magnificent collection which adorns and clothes the landscape in the picturesque grounds of Durris, and where there is probably one of the most extensive and varied assortments of the newer coniferæ to be found in the north of Scotland. At Fordell, near Inverkeithing, and in a lower altitude, in good soil of a deep nature but friable loam, on clay and gravel, they have been very successfully cultivated by the veteran and enterprising grower, Mr Foulis. He has reared the *Taxodium* there in quantity from seed, and the plants have in twenty-two years attained a height of 38 feet; but in

this situation Mr Foulis complains of even these naturalised specimens being liable to suffer rather severely in their foliage from the spring frosts of March and April; but he invariably finds them "throw it off," and does not record a single instance of this tendency having proved fatal to the *Taxodium*. Again at Hopetoun, Linlithgowshire, it has proved quite hardy in ordinary loamy soil, with clay and gravel subsoil, and grows fully as rapidly as the *Wellingtonia gigantea*. The largest specimen there is now about twenty years old, is 30 feet in height, and girths, at 6 feet from the ground, 3 feet 3 inches this season. At Castle-Kennedy, Wigtownshire, this conifer does not appear to be in so much favour with the intelligent and enthusiastic and deservedly successful grower, Mr Fowler, as many other of the splendid specimens which abound in this locality, not inaptly styled the "*Devonshire of Scotland*." He reports his tallest plant about 25 feet high, 4 feet 8 inches in girth at 1 foot from the ground, and 4 feet 6 inches at 3 feet up; but the species, he adds, although it lives, does not thrive freely, owing to the subsoil being open and porous, and consequently too dry for the vigorous development of the young wood. In this situation, also, the foliage acquires a rusty brown hue, which it retains for a long time, greatly marring its evergreen characteristics. At Dropmore, Maidenhead, Berks, the oldest *Taxodium sempervirens*, and which was planted in 1845, has now (in 1876) attained a height of 53 feet, with a girth at 1 foot from the ground, of 6 feet 9 inches, and at 3 feet up, of 6 feet 7 inches. Had this plant not been so unfortunate as to have twice lost its leading shoot, it would now have been much taller. On both occasions it sustained a check of fully three feet. The soil is naturally sterile and gravelly; but the plant is placed in a mound made up with soil from the roadsides over the natural soil, which is not more than 1 foot deep, and rests upon red gravel.

Other instances might be adduced to show that the *Taxodium sempervirens* is practically hardy in the climate of the British Isles, and will succeed well in almost all soils; but enough has been already said on these points; and it is perhaps only necessary to add, under this section of the report, that in introducing the *Taxodium* to any new locality, care should be taken not to plant the young trees in rich loam, as they are thereby induced to make large and rapid growth, and in this climate such shoots, before their wood is properly ripened, are very liable to be damaged by frost. Until acclimatised and accustomed to the site, young plants of this, as of many other of the rapidly growing conifers, are always most successfully reared for a few years after their introduction, by simply growing them, without any adventitious or stimulating aid, in the natural soil of the position in which they are planted. Another precaution to be observed in the planting of fast growing pines, such as the *Taxodium sem-*

pervirens, is to plant always in pits amongst well-loosened earth, for their rapidly formed rootlets are very tender, and are apt to be damaged by the ordinary "notch" system of planting, which moreover, seriously interferes with the rapid shooting out of the young branchlets, and development of the quickly formed terminal leader,—thus materially checking and retarding the natural habit of the species in the formation of young wood.

Where the soil into which it is intended to plant the *Taxodium sempervirens* is naturally deep and rich, it should be the planter's endeavour, if at all possible, to give it a northern exposure, so as to shelter it from sun's rays during the trying months of spring and autumn; but after being fairly established in such soils, this conifer will be found to succeed very well, for it must be remembered that in the native habitats of the Sequoias, the soil is of such a character. In regard to altitude, if we again refer to the native haunts of the *Taxodium*, and draw our own lessons of observation for guidance in planting in this country, we shall find that while the *Wellingtonia gigantea* is found tallest and most abundantly luxuriant at higher altitudes and in more inland situations than the *Taxodium sempervirens*, the latter, in its native haunts in the same latitudes, grows most freely and abundantly in situations with a lower altitude, and is found even down at the water's edge. It may therefore be assumed that it will succeed best in this country in localities of low or moderate elevation, provided shelter from frosty winds in early spring—after it has begun to push out its buds—be secured. Thus we find it thriving most luxuriantly along the banks of the Clyde near Dunoon, and in such localities. At Ardhallow, for example, within a few feet of the Clyde, and close to the influence of the sea-breeze, there is a most magnificent specimen growing in a light loam upon the rocky subsoil, and measuring 36 feet in height, and 4 feet 9 inches in circumference at 1 foot from the ground. This plant is in no way browned or injured by wind or sea-breeze. In other similar low altitudes the best specimens are found in Scotland, and indeed there is no doubt that it is far better adapted for, and much more likely to prove a useful and profitable timber tree in suitable positions in low altitudes than in the higher ones. At Dolphington, Lanarkshire, with 800 feet elevation, the *Taxodium sempervirens* will not grow, the altitude in that district being the chief reason of its failure.

The *Taxodium sempervirens* is admirably adapted for extensive planting in Ireland. The humidity of the atmosphere, fertility of soil, and general freedom from effects of easterly wind in that country, are eminently suitable for its rapid development into timber-producing dimensions. Many beautiful specimens abound in the various collections of newer coniferae, but it is to be regretted it has not been planted in quantity. One of the best specimens is growing at Claremont, and is situated in good deep soil, near the lake.

The principal hindrance to the extensive planting in quantity of any of the newer coniferae, after the suitability of the species has been fairly tested, is the price of young plants, consequent, no doubt, upon their scarcity in the first instance, but also to some extent on account of the demand for them. This will, in the course of time, work its own cure, and when such a species as the *Taxodium* has fairly established itself in public opinion, so as to be planted in masses, as we do Scots fir and spruce, we may then find it thriving better in this country; for, as in the case of the *Cedrus Decodara*, a grave error has been committed in this country since its introduction, in planting it as a specimen tree, and not in close order in spaces about 4 feet square apart on hill sides,—so in regard to the *Taxodium*, the isolation of specimens does not give a fair chance of success, in a new climate, to a pine accustomed to luxuriate in groves in its native habitats. Nor should the fear of having to sacrifice, by thinning while yet young, many of the plants if thus closely planted, operate against this suggestion. For the straightness of habit of the young trees, and the suppleness of their wood, should, independently of other properties of the *Taxodium*, which will shortly be referred to, render it a most valuable substitute for larch in any of the many purposes to which, as a young tree, that conifer is applied.

One striking feature in the *Taxodium sempervirens* is its bark. It is very thick, in old trees in California reaching sometimes to upwards of 2 feet, and of a dark rich brownish red colour, and is composed of a dense reticulated mass of corrugated layers running longitudinally round the stem or bole, while the intervening interstices are closely and firmly packed with fibres of a soft, elastic, light, spongy nature, which form a sort of padding, and probably from the protection afforded thereby to the young inner cells and wood of the stem, the tree derives that tenacity of life during severe winters for which it is remarkable, and which adds so materially to its recuperative energy, as to enable it when young to throw out young branchlets and foliage, even when the frost has been so intense as to kill most of its shoots of recent growth. This peculiar structure of the bark is also well adapted to enable the tree to resist with impunity the action of the severest gales, and prevents the wood, which is remarkably light and somewhat brittle when of large size, from being so readily liable to be snapped across by wind.

The peculiar red substance already referred to, which exudes from the wood and bark of the *Taxodium sempervirens*, hardens into the consistency of gum, and from analysis has been found to contain a kind of tannin, or "kino," which might be perhaps employed as a substitute for oak or larch bark in tanning processes. There is thus a new use suggested to which young trees of *Taxodium* might be profitably applied in this country; and were it thickly planted like larch in masses, and regularly

thinned, these thinnings might be peeled for bark, while their straight stems would command a ready sale for hop-poles, light spars, stobs, or such like purposes.

It may be interesting to note the difference and mark the details of measurement of the *Taxodium sempervirens*, under the favourable comparison of two trees, receiving similar treatment as to management, being in one place. At Belvoir, for example, this pine has been flourishing amongst the many other fine varieties of conifera which abound there; and one tree, raised from a cutting twenty years ago, and planted in its present site from the cutting-bed, is now a beautifully feathered specimen, densely clothed with drooping branches, the extremities of the longest of which, turn upwards in the most graceful manner, and the plant has attained to 32 feet in height, with a girth of 3 feet 8 inches at 1 foot from the ground. Another cutting-raised tree, more recently planted, when 5 feet 2 inches in height in 1866, in a small plantation upon a thin surface soil on a rocky substratum, and growing very freely in a situation sheltered by *Pinus laricio* and other trees, is now 27 feet in height, with a girth at 1 foot from the ground of 3 feet. The diameter and spread of branches, in the first instance, is 19 feet, while in the second it is 21 feet. In this situation, the *Taxodium* has, as in some other localities, proved itself somewhat fastidious; wherever it is sheltered, and has a fair depth of soil, it grows freely and vigorously, but, on the contrary, where there is a want of shelter, especially from the prevailing winds and spring frosts, it becomes irregularly branched, and assumes a meagre unhealthy appearance.

This characteristic is also to be found holding true of the species in other districts comprised in our inquiries, but with close planting in mass, and amongst other plantation nurses, the peculiarity will disappear; and it is also a noticeable fact that in some instances where young plants have failed from the usual common complaint of spring-frost effects, if by any chance in these localities, one or two of the plants survive and attain a height of 5 or 6 feet, they then become more hardy, being above the dew-line; and we have little doubt, if many plants *apparently* dead, after severe winds in March and April, were allowed to remain, and were not thrown out, they would be found to possess sufficient vitality to recruit, and yet develope good and hardy constitutions.

From these considerations, and others which we may now refer to in a few brief remarks, it may be suggested that, for the successful rearing of *Taxodium sempervirens*, and such other descriptions of the coniferous family as are liable to be injured by the late spring frosts in this country, and especially for such as are prone to throw out their young wood-growths early in the season, *home nursery seedlings*, reared in the soil, and about the altitude of the climate in which they are ultimately to grow, are far more certain of success, and appear to be hardier in constitu-

tion for the site than transplanted seedlings bought and sent from a distance, and probably from a very different position. It is to treatment of this description that the marvellous achievements of the late Mr Humphrey Graham of Belstane, in successfully rearing to timber size almost every species of the newer coniferæ in the poor bleak soil of the top of the Pentland Hills, in Mid-Lothian, are to be attributed; and were more care shown to this branch of arboriculture, namely, to the growing plants from good seed, in a small nursery on the estate which they are intended to adorn, there would be fewer records of failure in early years of several of the varieties. It is the same law, which is so well known in the agricultural world, that operates in the aboricultural field in this particular branch of Nature's economy. In high districts where the climate is cold, and the summers are short, we find the crops shorter and later, and field operations of all kinds carried on long after similar work is completed in the lower and earlier districts; and so it is with the tree seedlings of such sites. The operations of third growths are retarded, and Nature is, as it were, by slow degrees in the early years of the plant, made to alter her period of shooting into annual activity to a later date, so as to accommodate the life and functions of the seedling to the new conditions in its adopted sphere; and as "*habit becomes a second nature*," the seedling conifer sprouted and grown from its infancy under circumstances of climate somewhat uncongenial to its nature in its own habitats, becomes an altered variety in constitution, and acquires the ability to withstand the vicissitudes of temperature and exposure, which it would not acquire in its own country, or even at lower and more sheltered positions in Britain.

It will, of course, be apparent, from the foregoing remarks, that the results of the progress of the *Taxodium sempervirens*, since its introduction into this country, are yet too premature and recent to enable us to express anything like a definite opinion as to its future value, if more widely planted, as a profitable timber-producing tree, or of the rank which its wood might take in general estimation, and in comparison with our already well-known home woods. In those cases to which, in this paper, reference has been made, and which have come more immediately under personal observation, it appears that where the *Taxodium* has required to be cut down from some cause or other, the reports of the appearance and quality of its wood are, upon the whole, promising and favourable. That it is a rapid grower in good deep soil in chalks there is no doubt; and that the wood is well-coloured and grained—light, soft, and easily worked, and of a toughish, fibry nature, like common saugh. From cutting largish branches Mr Frost, of Dropmore, considers the wood likely to prove good for timber; and the opinion of Mr McLaren, the intelligent forester at Hopetoun, is, that while it grows

fully as rapidly as the Wellingtonia, the wood seems more durable, judging from branches he has cut, and he considers it will prove good timber. The veteran grower, Mr Foulis, at Fordell, near Inverkeithing, has grown the Taxodium from seed, and while with him they have attained nearly 40 feet in height, he finds the wood supple and close-grained, and of good quality; and at that size the bark remains soft, spongy, and of very considerably greater thickness than larch of the same age or height.

In its native habitats, the timber of the Taxodium is found to be close-grained, light, rather brittle when of large size, of a handsome red colour, and it is never attacked by insects.

Annexed are the dimensions of some of the largest and best specimens we have been able to find in this country, with details of the descriptions of soil in which they are growing, and their ages, so far as could be ascertained :—

British Statistics of Taxodium sempervirens (Californian Red Wood.)

Locality.	Height.		Circumference.		Soil, &c.	Remarks.
	Ft.	In.	1 ft.	3 ft.		
Balnagown, Ross, . .	30	0	3	4	Good loam.	Planted in 1843.
Garnstone, Hereford, .	58	0			{ Red clay loam on } { hard marl. }	Branches 98 ft. circumf.
Fulmodiston, Leicester,	51	0	4	0	Peaty and hard pan.	Planted in 1851.
Holkham, ,,	35	0	3	4	Good loam.	{ Do., within 1½ miles of } { high water mark. }
Loeton Knowls, Salop, "	44	0	5	10	Loam on sand.	Planted 29 years ago.
Banks of Ness, near In- } verness, }	26	0	3	2	{ Light loam on } { gravelly subsoil. }	{ It forks a few feet up, } { and the limbs quite 18 } { in., planted in 1864. }
Altyre,	20	0	2	6	Loam on gravelly,	{ Very healthy; altitude } { 180 feet. }
Dropmore, Maidenhead, } Eerks, }	5	0	6	9	{ About 1 ft. good } { soil; subsoil ste- } { rile and gravelly. }	Planted in 1845.
Castle Kennedy, Wigtown.	25	0	4	8	{ Light Loam on } { open and porous } { subsoil. }	{ Does not do so well as } { other conifers here. }
Hopetoun, Linlithgow, .	30	0	5	6	{ Loam on clayey } { subsoil. }	{ Grows as fast as Wel- } { lingtonæa. }
Ardhallow, Dunoon, } Argyllshire, }	36	0	4	9	Light loam, rocky.	Very handsome.
Carlowrie, Linlithgow, .	23	9	2	4	Good loam on clay.	Quite hardy.
Dupplin, Perthshire, .	48	0	4	10	{ Good loam 2½ ft. } { deep, on red } { sandstone. }	Very luxuriant.
Fordell, Fifeshire, . .	38	0	5	6	{ Medium loam, 18 } { in. deep, gravelly }	{ Thriving well, planted } { in 1854. }
Dalvey, Forres, . . .	30	0	3	9	Light loam, gravelly.	{ In sheltered site, but is } { not very luxuriant. }
Durris, Aberdeen, . .	35	0	2	10	{ Light soil, dry, } { gravel and rock. }	{ Planted in 1851. Very } { hardy. }
Do.,	32	0	3	5	Do.	{ Planted in 1846. Quite } { luxuriant. }
Glenapp, Ayrshire, . .	27	0	3	1	{ Light loam or } { gravel, and rotten }	{ Planted 26 years ago. 300 } { ft. above sea-level. }
Do.,	20	0	2	2	{ whinstone. }	{ 350 ft. above sea. }
Hampton Court, Leo- } minster, Hereford, . . }	31	0	6	6	{ Loam, or gravelly } { subsoil. }	{ Climate mild and humid. } { Very healthy. }

British Statistics of Taxodium sempervirens.—Continued.

Locality.	Height.	Circumference.		Soils, &c.	Remarks.
		1 ft.	3 ft.		
	Ft. In.	Ft. In.	Ft. In.		
Bucklesham, Ipswich, .	25 0	1 11	1 9	{ Peat 3 ft. deep, on } gravel.	{ 60 ft. above sea-level, very } { healthy and growing fast. }
Do., .	30 0	2 6	2 2	Do., on gravel.	Do.
Do., .	35 0	3 0	2 6	Do., on gravel.	Do.
Stoneleigh Abbey, War- } wickshire, }	60 0				{ Thriving in great per- } { fection. }
Beal, Prestonkirk, . . }	50 0		3 0		
Camperdown, Forfarshire, } Do., }	45 0 38 0	4 10 5 0	3 4 4 4	{ Made up loamy } soil, 18 in. deep. } Sandy loam on clay.	{ Growing on site of old } { Mansion - house, on } { subsoil of stone, brick, } { lime, &c. } Altitude 325 feet.
Weston Park, Salop, . }	42 0	6 3	5 0	{ Sandy loam on old } red sandstone. }	Very vigorous.
Belvoir Castle, Grantham, } Do., }	32 0 27 0	3 8 3 0	3 4 2 6	{ Deep red friable } loam on blue clay } { Thin surface soil } { on a rocky subsoil }	{ Shewing a great taper of } { stem. Very vigorous. } { Altitude 370 ft. A } { seedling 20 years old. } { Raised from cutting. } { Growing admirably. } { Altitude 400 feet. }
Muncaster Castle, Raven- } glass, Cumberland, . }	40 0	3 7	3 2	{ Light loam, sandy } clay subsoil. }	{ 190 ft. altitude. Thriv- } { ing well. Planted 21 } { years ago. }
Do., .	35 0	2 8	2 4	Do.	These two plants, al- though same age as the foregoing specimen given from Muncaster, were crowded and over- shadowed by old trees till recently.
Do., .	34 0	2 1	1 10	Do.	
Moncrieffe, Perth, . . }	36 0	5 3	5 0	{ Damp tilly loam } subsoil, red till } on freestone. }	{ Altitude 80 to 100 ft. } { Planted in 1854 or 1855. }
Longleat, Wilts, . . . }	63 0	9 6	8 0	Oxford clay.	{ In pleasure ground, and } { is very handsome. }
Strathfieldsaye, Winch- } field, Hants, . . . }	64 0	8 6	6 2	{ Red clay and thin } gravelly soil. }	{ Likely to prove a good } { timber tree. Planted } { in 1848. }
Dysart House, Fife, . . }	32 0	5 7	4 11	{ Light black soil } on sandstone. }	{ Growing at 60 ft. alti- } { tude. Diameter of } { branches 24 ft. }
Castle Menzies, Perthshire, } Whittinghame, East } Lothian, }	40 3 36 0	3 5 3 1	2 11 2 6	{ Sandy loam on } stones and debris. } { Strong stoney red } clay, and natur- } ally dry. }	{ 270 ft. above sea-level. } { Growing on site of old } { quarry. } { Altitude 340 feet. Very } { healthy. }
Beal, Northumberland, }	25 0	5 6	4 9	{ Light sandy loam } on gravel. }	{ 150 ft. altitude. Healthy } { and strong. }
Possingworth, Hawk- } hurst, Kent, . . . }	28 0	4 8	4 3	{ Light sandy loam } on sandstone } rock. }	{ Planted here by machine } { in 1868, and very thriv- } { ing when not exposed } { to wind. }
Do., }	29 6	4 6	4 1	Do.	{ Altitude 400 ft. Grows } { very fast when young. }
Wykeham Abbey, York- } shire, }	22 0	2 9	2 3	{ Alluvial soil, rest- } ing on peat. }	{ Altitude 150 ft. South- } { ern exposure. Vigorous. }
Do., }	26 0	2 10	1 9	Alluvial soil on sand.	{ 170 ft. altitude. Very } { robust. }
Do., }	17 0	1 11	1 4	{ Debris of free- } stone, on free- } stone. }	{ Altitude 180 ft. South- } { ern exposure. }

British Statistics of Taxodium sempervirens.—Continued.

Locality.	Height.	Circumference		Soils, &c.	Remarks.
		1 ft.	3 ft.		
	Ft. In.	Ft. In.	Ft. In.		
Stratford Court, Stroud,	35 0	6 0	5 10	{ Medium loam on gravel. }	{ Altitude about 190 ft. Quite healthy. }
Riccarton, Midlothian, .	38 0	3 6	3 0	{ Average yellow loam of moderate depth. Gravel and clay. }	{ Has lost its leader several times, or would have been much taller. }
Altyre, near Forres, . .	21 0	2 10	2 6		{ Has been about 18 years planted, and is very healthy. }
Hawkestone Park, North Shropshire, }	50 0	4 0	3 6	{ Clay soil, on clay and gravel. }	{ Altitude about 1000 ft. above sea-level. 17 years planted. }
Walls Park, Frome, } Somerset, }	56 6	6 10	6 1	Mountain limestone.	{ Lost its leader for some years. Quite vigorous. }
Abercairney, Perthshire,	35 0	5 2	5 0	{ Heavy loam on strong clay. }	{ Quite hardy. Altitude 150 ft. }
Rossie Priory, Perthshire,	50 3	9 6	7 10	{ Light black loam on hard till. }	{ A beautiful plant, feathered to the ground. Altitude about 80 ft. }
Pitfour Castle, Perthshire,	40 3	4 0	3 8	{ Loam on clay and sand. }	{ Altitude about 60 ft. Has had its leader frequently broken by Jackdaws, or would have been 50 ft. high now. }
Balgowan, Perthshire, .	41 6	3 9	3 4	{ Red loam, on old red sandstone. }	{ Seems to get hardier as it gets older and taller. Very vigorous. }
Raith, Fifeshire,	45 0	6 10	6 2	{ Rich loam on mud and gravel. }	{ 100 ft. above sea-level. Top has been frequently destroyed by birds and frosts. Measured in 1867. 31 ft. high. }
Bicton, Budleigh, Salterton, }	56 0	11 10	9 9	{ Light hazel loam on red sandstone. }	{ Lost its top repeatedly, but thriving. About 120 ft. altitude. }
Exton, Oakham, Co. Rutland, }	50 0	7 6	6 1	{ Rubbly soil on hard sand. }	{ Circumference of branches is 110 ft. Photograph of this tree sent to Arboricultural Society. 350 ft. above sea level. }
Cramond House, Midlothian, }	18 6	4 4	3 10	Sandy loam on sand.	{ Very healthy. A handsome tree. }
Craigiehall, Midlothian,	21 0	2 10	2 6	Do.	{ Very symmetrical. }
Southwick, Kirkcudbright,	33 0	8 6	7 6	{ Garden soil on sandy subsoil. }	{ Planted in 1844. Very handsome. }
Barcaple, Kirkcudbright,	30 0	5 1	4 3	Loam on rock.	{ Quite hardy. }
Terraughtie, Kirkcudbright, }	24 0	4 1	3 2	{ Wet loam on till subsoil. }	{ Planted in 1855. }
Dalscairth, Kirkcudbright,	35 0	7 4	4 2	{ Loam on rock subsoil. }	{ Planted in 1855. }

Note.—There are doubtless many other, and probably as fine, specimens of this interesting conifer in localities in Britain from which it has not been possible to collect information; but these sixty-three trees, accurately measured as they have been, will illustrate with sufficient correctness for the present, the geographical distribution of the best specimens we have been able to find in Britain, after careful inquiry and much trouble; and we would tender our best thanks to those correspondents who have so kindly complied with the request for the accurate data we have thus tabulated and given in this Appendix.

MANUAL OF AGRICULTURE, INCLUDING THE APPLICATION
THEREOF OF CHEMISTRY, GEOLOGY, BOTANY, ANIMAL
PHYSIOLOGY, AND METEOROLOGY.

By RICHARD HENDERSON, Coldstream, Berwickshire.

[*Premium—Twenty-Five Sovereigns.*]CHAPTER I.—*Introduction.*

AGRICULTURE, literally, tillage of the ground, is both a science and an art: a science, in so far as its principles are co-extensive with those of chemistry and the cognate physical sciences; an art, in the intelligent direction of these principles to the practical end of best developing the food-producing properties of the soil. The importance of founding the practice of this art in this country upon a more thorough and widely diffused knowledge of its scientific principles will be granted, when it is stated on the best authority, that by a generally thorough cultivation of the soil the annual agricultural products of Great Britain might be doubled in quantity. And it is a fact, that we annually import food from other countries to the value of L.80,000,000 sterling, which fact may, undoubtedly, increase commerce and beget the coinity of nations; but at the same time it might leave us in a hazardous position in the event of a sudden political emergency. Agriculture is the oldest of the arts; for we may rest assured that Adam delved, however problematical may be the question whether "Eve span." Amongst the ancient Egyptians, and later, under the Roman Empire, its practice attained a high measure of success, but it rested on a merely empirical basis. Not before the present century has any general scientific knowledge of the laws of nature, which regulate the art, characterised its numerous professors.

Whatever may be the varieties of soil and climate—and these, together with the subsidiary circumstances of available human labour and of markets, may be said to determine the particular mode of agriculture suitable for any locality,—the great fundamental laws, in conformity with which alone is truly successful practice possible, are comprised in the physical sciences following:—viz., Chemistry, Botany, Geology, Animal Physiology, and Meteorology. The last, to reverse the order, under the simple name of "weather," is a subject of interest, scientific or otherwise, to every farmer. It teaches a system of forecast of weather changes. Forewarning is forearmning; and by adjusting farm operations accordingly, great loss is avoided. Animal Physiology treats of the bodily structure and the functions of the bodily organs of our domesticated animals; and in that department of it we earn the general treatment best fitted to ensure their healthy procreation and profitable development. Geology has to do with

the formation and nature of the Earth's crust, the forces which have been at work in preparing it for its present condition, and those at present affecting its modification. In its relation to agriculture, it reveals to the farmer the various compositions of soils, and their derivation, and it gives him practical hints upon drainage operations. Botany, in its bearing upon agriculture, teaches the systematic classification of the various plants scattered over the face of the globe, their native localities, the variety of soil and climate best suited to the cultivation and growth of individual plants, and their internal structure, and modes of reproduction and growth. Chemistry—the grammar, so to speak, of all the physical sciences—acquaints us with the primary original materials of earth, air, and water, and consequently of all animal and vegetable life. As being the most fundamental of all the physical sciences bearing upon agriculture, its consideration in that relation comes naturally first.

CHAPTER II.—*Of Chemistry.*

Our earth, with its sea and atmosphere, and all whatsoever therein contained, is composed of about sixty-three original and simple elements, whose substance cannot be further reduced. Of these only four occur in the atmosphere; upwards of thirty have been found in sea water; whilst in the solid structure of the globe, the whole are to be found in varying proportions. They can exist in three states, viz., solid, liquid, or gaseous;* and that either alone or in combination. And such changes of state take place at fixed degrees of heat or temperature for each. The several elements consist of an aggregation of *atoms*, those of each particular element being always alike in material weight and volume. In the gaseous state, and whilst free from combination, the atoms of *all* the elements are of equal volume; but they vary in weight, and also, of course, in point of material. Although not in an apparent manner, the elements can, under certain conditions, be artificially reduced to their atomic state—*i.e.*, isolation of individual atoms—by the aid of heat or electricity. When thus reduced to the free, or as it is called, the *nascent* state, the atoms of any element have a tendency to unite with those of one or more different elements, when brought into contact with the latter. This is being continually effected through the agency of natural means; and, as will be seen, it is the cause of all physical change on our planet. The atoms of one element unite with those of another in certain fixed invariable proportions, and they have a greater tendency to unite with, or affinity for, those of some elements than of others. What is known as *chemical combination* is this union of the atoms of different elements,

*Liquids are technically known as incompressible fluids, and gasses as compressible fluids.

and the result is a compound body or substance. The least number of atoms in such an union, or rather, the least quantity of such a compound body, that can be formed, or exist in a free state, is called a *molecule*; wherefore, chemical compounds are composed of an aggregation of molecules. Still more complicated chemical compounds are formed by the union of the molecules of different compound bodies. The proportion of molecules requisite with a given quantity of different molecules, to form a new compound, is called the *equivalent* of the latter. In all chemical action, heat is given off or taken up; in the process of combination, it is evolved, in that of separation, its absorption is requisite thereto. A certain amount of heat is absorbed by all substances while they pass from the solid to the liquid, and from the liquid to the gaseous forms, which heat remains in abeyance—*latent*, until such substances are again transformed into their original forms, and then it is evolved. When the majority of chemical bodies assume the solid, instead of the liquid or gaseous form, they appear as small particles of a definite geometrical shape, called crystals, each compound invariably preserving its own peculiarly distinctive crystalline form. Moreover, whatever be the size of any united accumulation of specific crystals, the aggregate mass shapes itself into the geometrical type of its minutest constituent crystal. Chemical bodies not observing this law, in the process of their solidification, assume a structureless texture, and are called *amorphous*, literally, without form. Again, numerous compounds arising through the agency of animal and plant life, show neither a crystalline nor an amorphous, but a *cellular* or organised texture. A chemical combination of elements is something quite distinct from mixture pure and simple—that is to say, mere mechanical union. In the latter case, there is no interchange of the several atoms,—no chemical action takes place. There is merely mechanical juxtaposition of particles. By way of illustration, take the preparation of common mortar. There, before the addition of water to the lime shells, the latter are in the state called caustic lime, or oxide of calcium—a combination of the simple metallic element calcium, and the simple gaseous element oxygen—one atom of the one in chemical combination with one atom of the other; whence its technical symbol in chemistry Ca. O. Upon the addition of water, a violent disturbance in the mass occurs, together with the evolution of much heat. And this action continues until the certain amount of water requisite to enter into combination with all the caustic lime present has been added. Any amount of water superadded thereto, and the sand, are simply mixed with it mechanically. No further immediate chemical action ensues.

Another illustration of chemical combination is the common class-room experiment, showing the composition of water,

wherein the two gases oxygen and hydrogen are mixed in the proper proportions in a vessel. Still there is but mechanical union till a flame is applied, when the two gases instantaneously explode with violence, and the chemical combination will be found to have produced an entirely new body, a liquid-water.

The elements are, according to their possession of certain physical properties, arbitrarily divided into two classes—the metals and the non-metals. And those, again, which are met with in the combination present in animal and vegetable life, are further classified into two groups, viz., organic and inorganic.

The organic, in all substances, are capable of being separated from the inorganic, and driven off in the shape of gases, by simple combustion. The inorganic always remain, as the ashes of the substance consumed. In the organic elements life, animal or vegetable, may be said to have had its seat.

The terms, however, have another application,—“organic” being used in the case of those complicated compounds whereof the element carbon is an invariable constituent; “inorganic,” in that of the simpler compounds, with fewer atoms composing their molecules. Chemical compounds, according to their marked characteristics, are all classified under three divisions, viz., acids, bases, and salts. The first two exhibit quite different properties; but when, under certain conditions, they are brought into contact, they lose their distinguishing properties and unite to form the neutral compounds of the third division.

Particular acids are stronger than others, and can, so to speak, expel the weaker—those acids which have a less degree of affinity for the base—from the salts, and occupy the place in their stead. From a limited point of view, the most characteristic acids may be said to possess a sour taste, and the property of turning a solution of blue litmus to a red colour; whilst, on the other hand, the most marked bases, such as potash, soda, ammonia, and lime—alkalies so called—can restore the solution of blue litmus thus reddened to its original colour, and they have a peculiar soapy taste. To the chemist, however, the terms “acids” and “base” imply the possession of properties of a much wider and less limited description.

Out of all the chemical elements, about 18 only are discoverable in the blood and tissues of man and the lower animals, and in the juices and fibres of plants. Hence, these should exist in greater or less quantity in our cultivated soils, seeing that animal life depends primarily upon vegetable life, and that the latter again derives its main sustenance directly from the soil.

Of these 18, none exist in the free state, but as various compounds, in bodies animal and vegetable. They are:—

1st. Organic, comprising Oxygen, Hydrogen, Nitrogen, and Carbon; and

2d. Inorganic, comprising Silicon, Aluminium, Potassium, Sodium, Calcium, Magnesium, Phosphorus, Sulphur, Iron, Manganese, Chlorine, Bromine, Iodine, and Fluorine.

Oxygen.—Of all the elements, oxygen occurs the most abundantly throughout nature. It exists free in the atmosphere, of its total bulk contributing 1-5th part. In combination with other elements, it constitutes one-half the weight of the solid globe, and 8-9ths of that of water. It is an invisible gas, tasteless, and without smell. Excepting fluorine, it enters into combination with all the elements. In this process, called oxidation, heat is always, light sometimes, evolved. Flame consists of gas in a high state of ignition, caused by the oxidation of the substance consumed. During combustion, new chemical compounds, chiefly gaseous, are being formed, but no element is annihilated. Animals inhale oxygen into their lungs, where it oxidises certain elements in the blood and tissues, and thus keeps up the degree of warmth necessary for life. Oxidation is much more rapid in undiluted oxygen than in the atmosphere.

Hydrogen is another invisible gas, devoid of taste and smell. Its principal combination is with oxygen, in the form of water—two atoms of hydrogen to one of oxygen,—whence its chemical symbol H_2O . Hydrogen is the lightest of all the elements, and it is taken as the unit with which to compare the others. The symbolical letters, it may be remarked, representing the different elements, represent also their combining weights, or the weight of their respective atoms compared with hydrogen's. An atom, or any volume of oxygen, is 16 times the weight of an atom or equal volume of hydrogen; and as water is composed of two parts of hydrogen to one of oxygen, the latter constitutes 8-9ths of the weight and a third part of the volume of water. Hydrogen has been found free in sundry volcanic gases, and it can be obtained from the decomposition of water, through the agency of certain metals. Water enters into combination with many substances, and in so doing, in almost every instance, one of the atoms of hydrogen, in the molecule of water, is replaced by some equivalent in the compound into which it enters, and free hydrogen is given off.

Nitrogen is also an invisible, inodorous, tasteless gas. It exists free in the atmosphere, mixed with oxygen, forming about 4-5ths of the bulk of atmospheric air. It is a most inert element, incapable of entering into direct combination with any other except oxygen, and even then with difficulty, and only by means of the electric spark. By very indirect processes, however, it enters into important combinations with hydrogen as well as with oxygen. It forms five several oxides, the principal one of which is a combination of 5 atoms of oxygen with 2 of nitrogen.— N_2O_5 , which, combined with a molecule of water, constitutes

nitric acid, $\text{H}_2\text{O} + \text{N}_2\text{O}_5 = 2(\text{HNO}_3)$. With hydrogen, it forms ammonia—1 atom of nitrogen to 3 of hydrogen— NH_3 .

Carbon we meet with free and as a solid in three distinct forms, physically different, but possessing in common the same chemical properties. These are:—(a.) The precious diamond; (b.) graphite or plumbago, popularly known as black lead; and (c.) charcoal. It is found neither as a fluid nor a gas in the free state. It is present in all organised structures. It forms about 50 per cent. of the residue of plant life when the latter is charred, and access of atmospheric air or oxygen prevented, for oxidised carbon escapes as a gas. It enters into exceedingly complicated compounds, the consideration of which forms a special branch of chemical science, called organic chemistry. Combined with oxygen, it forms carbonic acid CO_2 —an invisible, ponderous gas.

Plant life is unable to assimilate these organic elements in their free state, but only when they exist in combination with certain other elements. Such compounds are water, nitric acid, ammonia, and carbonic acid. In the organised structures of plants these compounds are broken up or resolved, and their constituent parts economised in the building up of new organisations, which in their turn are metamorphosed for the structure of animal life. The atmosphere and soil, but chiefly the latter, are the media through which these elements are rendered available for the necessities of plant life.

Silicon.—Next directing the attention to the inorganic elements, it is to be remarked that silicon, next to oxygen, is the most abundant element in nature. It does not occur free, but as an oxide, SiO_2 , known as silicic or silica acid. In that state it is nearly pure, under the forms of quartz, flint, and sand. Silica, though in a variable quantity, is always present in the ashes of plants. Chiefly is it plentiful in cereals and grasses. It forms the hard glistening surface of straw and bamboo. In most plants, however, it rarely exceeds 5 or 6 per cent. of the residual ash.

Aluminium is a bright lustrous metal of excessive lightness. It does not occur free, but as an oxide— Al_2O_3 . There is but a slight trace of it in the ashes of plants, although in combination with silica, under the name of silicate of alumina, it forms the basis of the clay of our soil. From an agricultural point of view, it is therefore of importance.

Potassium, when with difficulty prepared free, is a light metal of silvery appearance, and so soft as easily to be cut with a knife. Thrown into water, it decomposes it. One atom of potassium replaces one atom of hydrogen, and heat is evolved in sufficient quantity to ignite the liberated hydrogen. It rapidly absorbs oxygen from the atmosphere, forming the oxide K_2O —Kalium

being the technical name given to potassium in chemistry. This oxide has a powerful affinity for water. The combination is potash KHO . The change can be represented by a chemical equation as follows:— $\text{K}_2\text{O} + \text{H}_2\text{O} = 2(\text{KHO})$. One molecule of oxide of potassium and one of water form two molecules of potash. It is one of the most important compounds in the ash of plants, forming from 20 to 50 per cent. of its weight. It is mainly present in roots and tubers, seeds and grasses, and in the leaves and branches of trees.

Sodium.—Sodium is a metal closely resembling potassium in all its features. These two, together with four other less important elements, which do not enter into living structures, are called the metals of the alkalis. They decompose water at all temperatures, and combining violently with oxygen, they form powerful caustic and alkaline basic oxides, which possess a strong affinity for water, which last cannot be expelled from them by heat agency alone. The principal oxide of sodium is Na_2O —*Natrium*=sodium. This combined with water is HNaO , or soda. The compounds of sodium are widely distributed, and along with those of potassium abound in the primary rocks, as well as in sea-water. Soda is a less important constituent, and forms a less proportion of the ash of plants than potash. It is more largely present in the ash of marine than of land plants.

Calcium.—Calcium, when free, is a light yellow metal. Readily combining with the oxygen of the atmosphere, it becomes the oxide CaO ,—lime. Lime has a strong affinity for water, and decomposes it at any temperature. It forms with water CaOH_2O , or slaked lime. Calcium compounds largely from the rock-forming materials of the globe, in such varieties as, *e.g.*, chalk and limestone. From the last, lime for ordinary use is prepared, by driving off, by means of heat, the carbonic acid,—limestone being a salt called carbonate of lime, composed of carbonic acid and lime as a base. Lime discharges most important functions in the soil, in the way of breaking up compounds, liberating their constituents in such a manner, as to render them readily available for the purposes of plant life. Its percentage in plant ash, varies as much as from 1 to 40.

Magnesium is a silvery white metal. If strongly heated, it takes fire in the air, burning with a dazzling white light, and forming the oxide MgO , known as magnesia. In dry air it does not oxidise. It is slowly acted upon by cold water, more rapidly by hot. As the carbonate of magnesia, it occurs, together with carbonate of lime, in enormous quantity in the species of limestone called dolomite. It most abounds in the ash of grains, contributing 12 or 13 per cent. of the same. In the ash of the remaining parts of cereals and of other plants, it varies from 2 to 4 per cent.

Phosphorus does not occur free in nature, but is generally to be found combined with oxygen and calcium. When prepared free, it is a yellowish semi-transparent, and waxy solid. It is exceedingly inflammable and oxidizable. It ignites on the slightest friction, whence chemists only keep it with safety under water. In the air it readily oxidizes, giving off white fumes, and in the dark emitting a pale lambent light. If slowly oxidized, its white fumes are the oxide P_2O_3 . Upon its ignition the resulting oxide is P_2O_5 ,—phosphoric acid. Phosphoric acid may be considered as the most important inorganic constituent of plant life. Seeds have it in larger quantity, as it constitutes about 30 per cent. of the residual ash of grains. It is equally important in animal life, being a most essential constituent of the brain, nerves, blood, and bones.

Sulphur is found free in nature as yellow crystals. It is found combined too, with many metals, forming sulphides,—which are the ores from which the several metals are usually obtained. Again, combined with oxygen in addition to the metals, it forms the salts called sulphates. Sulphur, during the process of ignition, produces the oxide SO_2 , a colourless gas, soon intimating its presence, however, by inducing the sense of suffocation. SO_3 is its principal oxide; which, combined with a molecule of water, is H_2SO_4 , the important sulphuric acid. The amount of sulphur found in the ash of plants is inconsiderable,—over 1 or 2 per cent.

Iron.—Of the invaluable element iron, the appearance and main properties are presumably known to all. It is rarely met with naturally pure, save in the form of meteoric stones; but in the well-known form of wrought iron it is nearly quite pure. Although for minga very small percentage of plant ash, it is still most essential, and to animal life, as well as plant, several parts of animal bodies demanding it in abundance for their constitution. It forms three classes of oxides, the presence of two of which in the soil is of moment. These are (*a*) the ferrous, or proto-oxide, Fe_2O_2 , and (*b*) the ferric, or per-oxide Fe_2O_3 . As the symbol shows, the ferrous has less oxygen in combination; but when exposed to the atmosphere, it greedily absorbs the additional amount of oxygen, which will constitute it the ferric oxide. Inasmuch as the latter, again, is easily divorced from the oxygen, in contact with other combinations in the soil, iron, it will be seen, discharges valuable functions there, as an oxygen contributor. It is iron also which imparts the variety of colour to the different classes of soil.

Manganese, prepared free, is a reddish-white, brittle, excessively hard metal, which the slightest exposure to the air oxidises. The oxide produced is MnO . MnO_2 , another of its oxides, is

much used in the laboratory for producing oxygen. The quantity of this element in plant life is very minute.

Chlorine is not found naturally free; but when produced free, it is a greenish yellow gas, pungently odorous, and most irritably injurious to the mucous membrane. For hydrogen it has a strong affinity, the combination forming hydrochloric acid. Combining with the metals, salts are produced by it, called chlorides, of which the principal is chloride of sodium, or common table salt.

Bromine, *Iodine*, and *Fluorine* all resemble chlorine in their respective qualities, the four forming a detached group in chemical science. Bromine and iodine are almost entirely confined to sea-water and marine plants. Traces of fluorine are found in the blood, teeth, and bones.

Copper.—Minute traces of copper have been found in the ashes of animal and vegetable organisations, but it is not considered a necessary element in the economy of animal and plant life.

The absorption, accordingly, of these inorganic or “mineral” constituents by plants, is entirely effected from the soil, by means of their roots. Such constituents are present in the soil in many various combinations, some of them being almost insoluble in water. Rain-water, however, dissolves carbonic acid from the atmospheric air, and water containing it in solution, can dissolve compounds insoluble in it whilst pure and simple. Carbonate and phosphate of lime are thus rendered available for plant nutrition. It is believed that some indirect power is exercised by plant roots themselves, in breaking up the insoluble compounds in the soil.

The different combinations in the soil affording the necessary inorganic elements to plant life, and the various functions of the latter to whose operation such combinations are subjected, fall to be discussed in a subsequent chapter.

CHAPTER III.—*Of Geology.*

The student, in having his attention turned to the science of geology, cannot fail to be struck with the vastness of the field which is there opened out to research; and when he encounters undeniable proofs of our globe having endured through countless ages ere it became fitted to receive its present species of inhabitants, he more distinctly can realise the hopeless incomprehensibility of the word eternity.

Whatever the source of the sixty-three original elements, the greatest physicists are of opinion that when these became united in the mass, resulting in an independent planet, ruled by the sun's attraction, such a degree of heat must have prevailed therein, as to cause such elements to exist in the gaseous state. As the heat would depart by radiation into proximate space, the denser compounds would tend to unite as a congeries, so that

when the earth had commenced its career of revolution around the sun, its consistence would be that of a pasty mass, enveloped with dense vapours and gases. Its present spheroidal shape would ensue upon its rapid revolution upon its own axis. With the process of cooling down would keep pace that of the condensation of its surrounding fogs and gases into air and water, whilst its more solid mass would concentrate in bulk, pressing inwards towards the centre of gravity with the attendant effect of irregularity of surface, caused by the absence of a uniform degree of internal resistance to such external pressure. With the increased intensity of this pressure, more marked would become mountain and valley. Moreover, the resisting force of the internally confined fluid substance would gradually prevail over the weaker portions of the crust, and its upheaval, with all the violence of earthquake and volcanic convulsion, would vastly exaggerate the superficial irregularity of Moses' "dry land." Thus did it appear above the face of the waters, but naked as yet,—sterile, without soil, entirely devoid of living organisation. Then gradually atmospheric action would crumble down those bare rocks exposed to its action. The *detritus* washed into the surrounding depth of waters, there subjected to the superincumbent pressure for epochs of time, became solid *strata* or layers, thence to be upheaved and exposed to the atmospheric process, as a rock-forming material different in nature and texture from its originators. And so on, the alternate depression and upheaval continues even to the present time, but in an infinitesimally less degree, for the cover of vegetation over the larger portion of the earth's surface protects from the erosive action of the atmosphere, and earthquakes are less frequent, and the more considerable volcanoes for the most part inert. By the earth's crust is meant the thickness of it which has come under the cognisance of geologists, and it bears an inappreciable proportion, of course, to the earth's diameter. Heat increases in the ratio of our depth of penetration through the crust, proving the immensity of heat still present within our globe, which is conjectured internally to be in a molten state, or at least in a honey-combed condition, with molten matter filling the cells. This is evidenced by the phenomena of lava and hot springs, even more strikingly than by the large increase of temperature in deep artificial mines. The rocks,—and this term includes clay, gravel, and sand deposits,—which compose this crust, are divided into—1st, The igneous, being those formed by the agency of fire, or from fused melted matter, and preserving their original condition; 2d, The aqueous or sedimentary, comprising such as have been formed by the deposit of detritus of rocks exposed to the air, and laid down under the water in regular strata; 3d, The aerial, or such deposits as have been accumulated by atmospheric agencies. Sand dunes, calca-

reous sands compacted by rain, the debris at the bottom of cliffs, and soil are examples; 4th, The metamorphic, those which have undergone change of texture since the eruption or deposit of their constituents. Traces of organised remains begin to be met with in the earliest aqueous rocks, and thus attain a higher development in proportion to our ascent to the latest aqueous deposits,—stratifications,—till it becomes perfect as that of the living forms, both animal and vegetable, now existing. The branch of geology dealing with such traces, or fossils, as they are called, testifying to the forms of life co-existent with the deposition of the specific materials of the strata where they are found, is named Palæontology—an abstruse study, its prosecution demanding the preliminary of a highly scientific training.

The igneous rocks principally exist as granite and trap. They are chemical productions, *i.e.*, have been consolidated from fusion by chemical means. Besides forming the solid framework of the earth, and the foundation of the other rocks, they are upheaved, and constitute the principal mountain chains, and they are exposed in masses of enormous area. They are also poured out in profusion as lava and scoriæ during volcanic action, and they permeate the rents and crevices of the sedimentary rocks. All igneous rocks are composed of minerals, silicates, to wit, *i.e.*, salts formed by the union of silicic acid with a base. These silicates are divided into two classes—silicates of magnesia and silicates of alumina; and the various subdivisions in each are constituted by so many mixtures with silicates of potash, soda, lime, iron, manganese, &c. The uncovered masses of igneous rock generally being situated at high altitudes, the soils they form are at such an elevation as to be incapable of cultivation, and they are accordingly left in the natural condition. But when such soils exist in practicable situations for the agriculturist, or the *detritus* of them is conveyed thither, great fertility obtains, and the soil is easily worked. This is specially predicable of soils derived from trap rocks.

Metamorphic rocks are produced by the alterations effected by heat in the texture and structure, and by its rearrangement of the atoms of the constituents of their originators. Although resulting from the changes in strata of all epochs, still they, for the most part, lie over or against the huge igneous masses, being comprehended in the so-called Laurentian, Cambrian, and Silurian eras of formation. Together with the igneous, they constitute the principal part of wilder Wales and the Scotch Highlands; and whilst such tracts admit of little cultivation, they are admirably suited for sheep runs.

The stratified rocks have been produced mechanically, as we have seen, by the agency of the atmosphere and water; chemically by the precipitation of their constituents from solution in

water, *e.g.*, rock salt; and organically by the agency of organised living structures, *e.g.*, coal and peat, both of which are the remains of plant life, and limestone, the remains of minute animalculæ. Stratified rocks have a threefold classification, denoting the epochs of their respective formations, *viz.*, the Primary or Palæozoic—ancient; Secondary or Mesozoic—middle; and Tertiary or Cainozoic—modern. The expression primary; signifies no fixed era or standpoint of time,—merely that indefinite portion of the past when the first sedimentary rocks began to be deposited beneath the water. By “era,” too, the geologist understands any period comprehending groups of living organisms bearing points of close resemblance to each other. The names given to the different formations have generally been taken from that of the most characteristic or useful rock in the group, which may sometimes include a stratum of quite an opposite texture and composition. Thus the old red sandstone formation includes some of the densest clay rocks, and it may appear contradictory to apply the term sandstone, clearly suitable in one district to the clay slate of another. But as these two contain the identical class of fossils, their similarity of age is demonstrated, and hence the justice of their sharing the same family appellation.

The stratified rocks are arranged in the following leading groups, in order of time:—

- I. *Those of the Primary or Palæozoic period, including*
 - (a.) The Laurentian or Pre-Cambrian era rocks, which are principally composed of gneiss, a metamorphosed granite, whose original granite particles have been disintegrated and redeposited, and compacted with a different structure and texture.
 - (b.) Cambrian era rocks, composed of grits, slates, and conglomerates.
 - (c.) Silurian era, divided into (1) lower, comprising the Lingula Llandeilo, and Caradoc beds, and (2) the upper division, comprising the Llandovery, Wenlock, and Ludlow beds.
 - (d.) Devonian and Old Red Sandstone era, comprising the lower, middle, and upper Devonian beds of England, and the like three Old Red Sandstone beds of Scotland.
 - (e.) Carboniferous.—Carboniferous or mountain limestone, millstone grit, and the coal measures.
 - (f.) Permian—the lower, containing red marl, sandstone, and conglomerate, and upper containing lower and upper magnesian limestone.
- II. *Secondary or Mesozoic period, containing*
 - (a.) Triassic, or New Red Sandstone, of lower, middle, and upper formations.
 - (b.) Jurassic era, embracing Lias (lower, middle, and upper);

Oolite, lower—inferior oolite, fullers' earth, great or Bath oolite, forest marble; middle—Oxford clay, coralline oolite; and the upper—Kimmeridge clay, Portland and Purbeck beds.

(c.) Cretaceous era—Hastings sand, Weald clay, lower greensand, gault, upper greensand, chalk marls, and chalk.

III. *Tertiary or Cainozoic period, including*

(a.) Eocene era—lower, middle, and upper,—the lower including plastic and London clays, and the middle and upper the deposits formed in estuaries.

(b.) Miocene era—Lignites and leaf-beds.

(c.) Pliocene era—Crag formations.

(d.) Pleistocene or post-tertiary era, comprising boulder clay or glacial drift, raised sea beaches, fens, peat bogs, river deltas, alluvium, sand dunes, and so on.

These main groups, and, with a few exceptions, the various strata they respectively comprise are all represented in the British Islands,—an evidence of the extensive convulsions they have undergone.

Although in few countries do they observe such an unbroken series, still they invariably observe the cardinal order of deposition, whatever hiatus may occur in it. Periodic convulsion throughout immense areas is evidenced by the existence of fossils of land plants, which flourished on the soil of certain strata, being discovered beneath immense stratification of a different class. To the variety of the British rock formations are due the multiplicity of its types of natural scenery, its many different modes of agricultural practice—all included, too, within so small a superficies. This variation in practice is a consequence of the variety of soil, which, as a rule, has a direct relation to its underlying rock formation. By the term "soil" is understood so much of the surface as in cultivated ground comes under the operation of the plough, and which in land still in a state of nature would come under such influence were it to be cultivated: "subsoil" is what comes immediately under it. Where identity of chemical constituents does not exist between the soil and its subjacent rock formation, the constituents of the former have been imported from another source. But in all cases, rock and subsoil alike have an important bearing upon the questions of facility of drainage, the physical features of exposure, flatness, or declivity of the soil.

As already mentioned, the soils of the Laurentian, Cambrian, and Silurian eras are mostly found at a high elevation; and, in addition, being for most part of a poor description, are seldom cultivated with any degree of success. On the other hand, those of the Devonian and its companion series possess all degrees of value.

In the Carboniferous era, the soils of the coal measures groups are inferior, and generally much neglected; those of the millstone grit are also poor and thin. In the mountain limestone group, they are classed as of medium quality; and, as in Derbyshire, they afford good pasture ground. In the Permian, the soils are of a light, dry description, and easily cultivable. As the name implies, most of its limestone holds too much magnesia for agricultural purposes. Of the Triassic era, the soils are variable. They are kept under pasturage, over the marls, and are then good for dairy purposes. Above the sandstones they are deep and dry, although not of high quality. In the Jurassic, they range from the densest quality, such as, *e.g.*, Lias, Oxford, and Bradford stiff clays, to that of a thin light sandy type. Excepting those above the chalk marls, the gaults and wealden clays, the Cretaceous affords soils of a light dry nature, which produce, under pasturage, an excellent herbage, sweet and nutritious, and well adapted for sheep stock. Coming to the Eocene era, we find such dense soils as the London clay, with others of a lighter description in immediate contact with them. In the Pliocene, we encounter the soils typified by the rich alluvium of river-side deposits—the “carse”, lands of Scotland, deltas; and also meet fens, peat-mosses, and land reclaimed Dutch-wise, from the sea.

In districts where the subsoil is deep, and a considerable space intervenes between the upper soil and its underlying rocks, there is generally a scarcity of stones for building or road-making purposes; and this is especially the case in clayey formations, and those of the Pleistocene era. The clay, however, can be burnt into bricks, and material in substitution of road “metal”—which latter, however, is a poor make-shift for stone. The nature of the subjacent rocky formations too has considerable influence upon the question of water supply. Thus the numerous fissures in the chalk and oolite formations act as natural main drains throughout large areas, intensifying the droughts of hot summers. The opposite extreme is reached when rocks or subsoils are of a close or retentive description, unfavourable to the percolation of water. Hence it is that a knowledge of the position and nature of the subsoil and underlying rocks is essential in the conduct of extensive drainage works. The term “dip” means the inclination of strata to the earth’s centre, and is measured by the angle formed by the intersection of the plane of the horizon with the plane of the beds themselves. “Strike” means a line at right angles to the dip. “Outcrop” is where the beds appear at the surface. By rock “structure” is meant the peculiar arrangement of its component parts in the mass, *e.g.*, stratified or columnar structure (like that of the igneous rocks of Staffa and the Giant’s Causeway.) “Texture” implies the minute arrangement of the composing particles; and “compositions” applies to their chemical

features. "Joints" are the lines of fracture seen dividing rock masses into separate lumps or blocks, and which facilitate the quarrying of them. "Faults" are such fractures of the strata series as raise or depress the level of the strata on one side of such faults above or below that of the strata on their other side, and thus break the continuity of stratification.

CHAPTER IV.—*Of Botany.*

Of the science of Botany, physiological botany is that one of its departments which most concerns the practical agriculturist, treating, as it does, of the different organs of plants, and their respective functions. The classification of plant life is a field of study too extensive for his time and opportunities. But as all the British cultivated plants are included in a very few "orders," the comparative slightness of their physiological variations renders his acquisition of this branch so much the easier by its approximation to a uniform applicability.

A normally developed plant consists of four different organs, viz., root, stem, leaves, and flowers,—the first three being nutritive organs, and the fourth that of reproduction. They are alike modifications of one structure, for the fundamental structure of all plant forms is the simple cell. Cells are minute, round, bladder-like vessels, which cohere and form cellular tissue, named *parenchyma*. They have their origin in a thin mucilaginous compound called *protoplasm*, which is considered the seat of life. A small germ, termed a *nucleus*, appears in the protoplasm, which presently, with some of the protoplasm, gets enclosed by a species of sac or covering, and this constitutes a cell. Increasing, the nucleus seems to be divided, and the cell-wall closing round either portion, forms two distinct cells. And so on indefinitely. This cell-wall or envelope is formed of a substance termed cellulose, the composition of which will be subsequently given. Active cells, besides containing protoplasm and nuclei, for the purposes of increase, and also their several characteristic contents, have, when situated at the exterior portions of plants, *chlorophyll* as well, which is their green colouring matter, and has the property, when it is acted upon by sunlight, of assimilating certain elements from the atmosphere. The shells of nuts and other seeds are composed of hard solidified cells; the roots of turnips, potatoes, &c., almost entirely of juicy cells. The cell-walls or coverings of different plant groups have characteristic marks, whether dotted, barred, reticulated, or with spirals or other quaint devices. Cells cohere by means of connective tissue, supposed to be secreted from their walls. "Intercellular" canals are the spaces formed where cells do not adhere on all sides; and they serve for circulating air through the plant structure. Fibres

and vessels are formed by the modification of simple cells. The former appear to be formed of elongated cells, which have been filled up with woody substances. These firmly cohering, form woody fibre. The cells of vessels are not thickened or filled up. They are formed by strings of cells, so to speak, having their contiguous partitions destroyed, so as to form a continuous tube or channel. They possess the distinctive markings of the cells, whence they are derivative. Their office would appear to be that of promoting not sap but air circulation in plants. Cells constitute the entire formation of some plants, such as fungi, mosses, and sea plants; and these are termed cellular. They have no flowers, and propagate by means of cellular germs. The remaining plants are called *vascular*, as they contain vessels, fibres, and cells. Excepting the fern tribes, they have flowers more or less conspicuous, and they are reproduced by the instrumentality of true seeds.

A cellular skin or covering, called the *epidermis*, extends over every part of the plant. It is divided into the *cuticle* or outer portion, and the *derma* or inner portion. The cells composing it are colourless, but through them shines the chlorophyll contained in the cells underneath. When examined by aid of the microscope, on its surface are seen oval-shaped organs with small openings in their centres leading through the epidermis into air chambers. These openings are called *stomata*, and serve for the purposes of perspiration and exhalation of liquids and gases. They are found on all parts of the plant above ground, excepting the petals or coloured portions of the flower, and they seem to possess the power of opening and closing according to the moist or dry condition of the atmosphere. The epidermal cells get modified to assume the form of hairs and scales, as seen on leaves and other parts of certain plants.

Selecting the root as the first organ for consideration, the student must make its acquaintance as the "descending axis" of botanists. It is the seed's primary development, and always has a downward direction. This delicate process branches into numerous fibrils, whose number and dimensions rapidly increase. "Radicule hairs" are scattered over them, and through these and the cells of the more delicate parts of the fibrils' epidermis is absorbed the plant's nourishment from the soil. The elongation of roots proceeding from their extremities, they are fitted to penetrate in every direction in quest of suitable food. This organ's development assumes a great diversity of form. Of species, we have *terrestrial* roots, such as have been already described,—though it may be remarked that the roots of fungi, as in the case of sea-weeds, merely serve for anchors, the fungus obtaining its food from the atmosphere; *aquatic* roots, belonging to floating plants, which are unattached, floating freely in the

water, and absorbing nutrition from that medium, *e.g.*, duck weed; *aerial*, as in the family of orchids, which in the tropics are attached to foliage, and their roots hang in the air, whose moisture they absorb, and against the branches, whence they derive food from the tree's decay; and *parasitic*, those fastened to the substance of other plants whose sap they absorb, and they have no direct connection with the soil. Such are moulds, the dodder, injurious to clover, and the festive mistletoe.

The root functions accordingly are, with exceptions to fix the plant, to absorb nourishment from the soil, and occasionally, as in the turnip, to serve as a magazine of nourishment for the plant's use in promoting its growth at a future season. The absorbent cells of roots would appear to possess a power of selection and rejection over suitable and injurious food constituents. The absorbitive process is considered to be that of *endomosis*, which signifies the property of gases and fluids, enabling them to pass through certain membranes in order to mingle with other fluids and gases possessing different densities and compositions. "*Exomosis*" expresses the converse process.

The stem is the organ which bears the leaves and flowers; and, like the root, it assumes all possible phases of modification. Some stems are long, others short, so as to be scarcely seen above ground; some burrow to a varied extent under ground; whilst others again, for support, have to cling to stronger neighbours; familiar specimens, whereof respectively are ordinary trees and grain plants, the turnip, the quicken grass and potato, and ivy. The tuber of the potato is in fact a stem, its eyes the buds, producing branches and leaves. Stems are divided into three great classes, *viz.*, exogenous, endogenous, and acrogenous. A stem of the first of these divisions increases in diameter by the addition of matter to its outer circumference. A cross section shows in its centre the pith, with lines radiating from it to the circumference or bark, which are called medullary rays, and concentric rings round the pith, each marking a year's growth. Outermost is the bark, easily separable from the wood proper. The annual increase to wood and bark takes place immediately under the latter in a layer of slimy substance termed the cambium. The outer and newer wood is called the laburnum, the inner or heart-wood, which is denser, generally of a darker colour, and through which there is less sap circulation, is named the duramen. The bark has three layers,—the innermost tough and fibrous, forming in some plants, *e.g.*, flax, "the bast."

An endogenous stem increases in diameter by the collection in its cellular centre of bundles of fibres and vessels, which swell out and extend the outer circumference. In a cross section we see no pith, no concentric rings, no true separable bark, but on the contrary, a hardened cellular mass of bundles of vessels and

an internally hard inseparable bark. These fascicles of fibres run from the bark inwards and downwards towards the stem's centre, effecting a firmly interlaced structure.

The increase of an acrogenous stem takes place at its summit, as exemplified in the case of ferns and tree-ferns. The whole length is of nearly the same diameter, it is marked on the outside by the scars of leaves, whose bases, indeed, compose it. In cross section there appears a cellular mass, often hollow in the centre, with bundles of vessels interspersed throughout. Stems produce buds, or branches bearing them; in some cases only at their extremities, "terminal" buds, in whose destruction is involved the death of the plant; in other cases, both terminal and lateral. Some buds, instead of developing into branches, become modified into thorns. Both branches and thorns have a continuity of the central stem-substance, and are thus distinguished from such prickles as, *e.g.*, the briars, which are merely developments of the epidermis, having no direct connection with the stem. The functions of the stem are chiefly to support the leaves and flowers, and to afford them a due exposure to the influence of sun and air. The modifications of leaf form are endless. Microscopically examined, the leaf epidermis shows numerous hairs and stomata. Immediately beneath it are discovered elongated or "palisaded" cells, having a close vertical arrangement; and spaces are numerous interspersed, corresponding with the stomata above. Inferiorly occur other cells more freely and openly arranged, with the fibres and vessels constituting the veins of the leaf running through them. The arrangement of leaf-veins—the venation of leaves—affords another means of plant classification. Along with exogenous stems, plants have a reticulated venation:—with endogenous, a herring-bone, venation, or the veins running parallel from the central vein to the leaf's margin. The petiole or leaf-stalk attaches it to the stem. On any ordinary tree it is more or less round and fibrous; in the rhubarb plant again, it is thick and juicy, and constitutes the edible part. Sometimes it has almost the identical functions of the leaf itself; in sundry pines there is no distinction. The functions of the leaf are occasionally assumed by the stipules—small leaflet-like bodies at the base of the petiole, and very apparent in rose, pansy, and clover plants. Frequently they form tendrils and sheaths of the petiole. The midrib or central main vein of the leaf is a continuation of the petiole.

Leaves are either simple or compound,—the former when the petiole carries but one blade, and has no joint above the point of union with the stem. Such are the leaves of the oak or beech trees. Compound leaves have their blades subdivided into separate distinct lengths, each of them being articulated to the petiole, as in the case of the horse-chestnut. Leaf margins may

be entire, serrated, crenate, and so on; the blades, according to the apex, acute, obtuse, &c. When divided laterally from margin to midrib they cleft pinnately; longitudinally, they are palmately cleft, and so forth.

Vernation is the varied mode of the folding up of young leaves in the bud. The attachment of leaves to stem is spirally arranged in a strict mathematical order. There is the like analogy between branches and stems, rootlets and root. Certain plants lose their leaves annually, others retain them permanently. Of the first division, the leaves of some wither and fall away on the completion of bud formation. Such plants are called deciduous, as oak and ash trees. Of others, the leaves wither and decay, but still adhere, as do those of lilies. Plants of the second division retain their leaves of one season's growth till the full development of their successors in the next; the majority of our evergreens for example. When their functions have been nearly discharged, leaves change their colour, and from the secretion of inorganic matter in their cells, they shrivel up. Simultaneously, a constriction of the base of the petiole becomes gradually complete, whereupon all the cells of stalk and leaf die, and the latter falls to the ground.

Leaf functions are analogous to those of the lungs. Leaves seem to expose plant sap to the action of air and light, which frees their juices from excessive moisture, and induces such chemical changes of their substance as elaborate them into suitable compounds for assimilation by the plant, to the end that in all its parts cell-building may multiply.

In certain plants the leaves are possessed of strange supplementary powers. For instance, the leaf of Venus's fly-trap has the property of curling inwards and enfolding the luckless insect which may have alighted thereon. And stranger still, this duress is effected from a carnivorous propensity; for physiologists declare that the plant thereupon absorbs the juices of the insect for its own nourishment. In the pitcher plant some of the leaves act as watertight reservoirs, by assuming the form and direction best suited for receiving the supply of moisture; and frequently they contain a considerable supply of water. The large quantity of fluid containing solid and gaseous bodies in solution, and absorbed by the delicate cells of roots, has an upward current through the central portion of the stem, and reaching the leaves, where it undergoes the changes adverted to, it next takes a downward current through the interior parts of the stem, delivering growth materials through its course.

The belief at one time was general of the excretory power of roots over plant waste and matter injurious to its health; but it has been surrendered by contemporary physiologists. The absorbent and exhalent power of plants over moisture has, it will be seen,

an important influence upon the passage of water from soil to atmosphere, when the immense extent of forest area throughout the world is considered. Much of it, however, is retransferred to the ground, having been condensed on the colder leaf surface by warmer air currents. The wholesale hewing down of forests has been observed to produce a scarcity of rain in regions where no such privation existed while the forests flourished. Plants by their green colouring matter act as purifiers of the air by absorbing carbonic acid, so hurtful in excess to animal life. This process is accomplished by such colouring matter when subjected to solar action, decomposing the acid, and whilst freeing the oxygen, assimilating the carbon.

A flower when normally developed consists of four parts—two called the enveloping organs, viz., the calyx or outer circle, and the corolla or coloured portion, and the remaining two called the essential organs, as being necessary for the production of seed, and named respectively the stamens, and in the centre the pistil. All parts alike are modifications of the leaf. The leaves forming the calyx are named sepals; those of the corolla, petals; and in each they occur, either united or separate, and assume infinity of shape. The stamen consists of a stalk or filament, frequently so short as to make it appear absent, which supports two bags called anther lobes, these containing a dust powder—the pollen of the flower, necessary for the fertilising of the ovules or germs of the embryo, and these are held by the pistil or ovary. Above this last is the style or stalk, having at its extremity the stigma, upon which the pollen must be deposited ere it can come into contact with the ovules. The changes in the bean flower may be taken to illustrate the stages of the reproductive process. The grains of pollen on the stigma extend minute processes down the style into the ovary, where, coming into contact with the ovules, fertilisation ensues. Next the calyx, corolla, and stamens, having performed their functions, wither and die. The pistil or ovary is now disclosed, as having assumed the shape of a pod, and within it the fertilised ovules have developed into a row of beans or seeds. The plants of some varieties have staminate or male flowers on some of them; pistillate or feminine flowers on others. Others bear both sexes on one and the same plant; whilst the generality bear flowers containing both stamen and pistil together, and these are called perfect flowers. The various modes of fertilisation in plants is an interesting study; and the unlikely agencies through which the access of pollen to the ovules is effected bear evidence of the highest design. Insects have a great share in this office, through the adherent pollen on their legs and bodies getting deposited on the stigmata of the successive flowers upon which they alight. Indeed, it is maintained by the most eminent

savants that the primary office of the many bright hues, varied scents, and tasted secretions of flowers, is to allure the visitation of the insect tribe for the purpose of pollen transportation. The wind also carries many kinds of pollen dust to its due destination.

To enter upon the consideration of the countless different conformation of parts, relation as to numbers and modes of arrangement of the flower, would be to transgress the limits of this manual.

The seed, then, is the fertilised matured ovule. It contains, along with a new plant in embryo, a supply of nutriment for its sustenance when it begins to germinate, and before it can derive that from the soil direct. The embryo consists of the radicle, or root rudiment, the seed leaves or lobes called cotyledons, and the plumule or young stem. The number of cotyledons affords yet another standard of plant classification. Exogenous stemmed plants have two cotyledons in their seeds, and hence are called dicotyledonous; endogenous, only one, and are therefore styled monocotyledonous; whilst flowerless plants which have no true seeds, and consequently no cotyledons, are named acotyledons. In the pea and bean the supply of nutrition is incorporated with the cotyledons; in grains it is quite distinct and separate from them. In the former the cotyledons remain beneath the surface, and are absorbed by the radicle and plumule. From the turnip seed the two cotyledons spring above ground, appearing as two smooth leaves, and only decaying when the rough leaves proper sprout and develop. It is with these tender cotyledons that the turnip beetle or "fly" works such havoc, consuming them and thereby arresting the seed functions. All grasses and grains are monocotyledonous. The principal food ingredients stored up with the embryo in the seeds are starch and nitrogenous and phosphatic compounds. The absence of direct light and the presence of air and moisture are necessary for the germination of the seed. The air and moisture are requisite for effecting chemical changes essential to germination; the latter softens the seed constituents, and with the oxygen in contact the atoms change places, and soluble compounds are formed. Those are absorbed by the cells of the embryo, its several processes are developed, and the rudiments of root and stem produced.

The complicated bodies,—called the proximate constituents,—elaborated and organised by plant life from the simple inorganic compounds derived from soil and atmosphere, are classified into three divisions, according to the different kinds of nutrition these subserve in the animal body. The three divisions are as follows: the Amylaceous or Saccharine, Oleaginous, and the Albuminous. The first group is entirely composed of carbon, hydrogen, and oxygen, the two last entering in the exact proportions requisite

to form water, whence they are often termed carbo-hydrates. In Roscoe's Chemistry they are arranged under the heads of Sucroses, $C_{12}H_{22}O_{11}$, represented by sucrose or cane sugar; Glucoses, $C_6H_{12}O_6$, represented by dextrose or grape sugar; and Amyloses, $C_6H_{10}O_5$, represented by dextrin, starch, cellulose, and gum. The amyloses are insoluble in water, but the action of certain acids converts them into dextrose, which is soluble in water; although not to the same extent as is sucrose. Gum and cellulose are with difficulty converted into dextrose; starch, less so. Starch, however, soon assumes a soluble form under the action of the saliva and other juices of the body. The action of the organic compound diastase, which is always found present in seeds beginning to germinate, renders starch stored up in the seed soluble for the use of the embryo at that stage. The starch first assumes the properties of dextrin, and then it is readily changed to dextrose. It will be noticed that the addition of one molecule of water to those of the third division will make them assume the same formula as those of the second.

The composition of the oleaginous compounds is the same, but with the amount of hydrogen much in excess of the proportion necessary, with the contained oxygen to form water. Consequently, they are styled hydro-carbons. Glycerin, $C_3H_8O_3$, is the base of all fatty compounds, which vary with the different proportions of acids in combination with it. Most fats and oils contain a mixture of all these. The three principal acids are—palmitic, $C_{16}H_{32}O_2$; oleic, $C_{18}H_{34}O_2$; and stearic, $C_{18}H_{36}O_2$.

The albuminous compounds contain nitrogen, carbon, hydrogen, oxygen, phosphorus, and sulphur; they are also called the nitrogenous compounds. The composition of them all varies but little; and they are convertible by a slight rearrangement of atoms. These compounds are derivable by animals only from vegetable sources. They are assimilated without undergoing much alteration; and in the animal constitution have almost the identical composition as the relative compounds in plant life. The following table shows the composition of the principal members of this group which are met with in the animal body:—

	Albumin.	Fibrin.	Casein.
Carbon, . . .	53·5	52·7	53·8
Hydrogen, . . .	7·0	6·9	7·2
Nitrogen, . . .	15·5	15·4	15·6
Oxygen, . . .	22·0	23·5	22·5
Sulphur, . . .	1·6	1·2	0·9
Phosphorus, . . .	0·4	0·3	0·0
	<hr/> 100·0	<hr/> 100·0	<hr/> 100·0

Albumin and fibrin abound in blood and muscle. The gluten of wheat corresponds to fibrin; and albumin is found in the juices and seeds of plants. Casein is the albuminous compound

present in milk. The legumin of the leguminous plants, *e.g.*, peas, beans, clovers, and the avenin of oats correspond with it.

There are two great systems of plant classification—the artificial and the natural. The artificial, or Linnæan, as it is called, after its inventor, the Swedish *savant* Linnæus, takes as the standard of its class division the relative number and position of stamens and pistils. The latter system, however, has ousted the Linnæan from modern use. And, more scientifically, the natural system bases its principle of division upon similarity of internal structure, and composition, and modification of organs in plant groups.

All plants are primarily divided into flowering and flowerless. Excepting a few of the more highly-developed individuals of the latter class (ferns for example, as representing acrogenous stemmed plants), they are all cellular plants, reproducing through the agency of minute germs or spores. Flowering plants are further divided into “classes”—those, firstly, with exogenous, and secondly, those with endogenous stems. As previously stated, the possession of an exogenous stem is accompanied with that of reticulated leaf veneration, and the presence of two cotyledons in the seed.

Classes are subdivided into “sub-classes,” which are distinguished by the presence or absence and varying arrangement of the enveloping organs, and the relative position of the essential organs of the flower. Next come “orders,” or “families,” embracing forms of a generally uniform structure, especially as regards flower and fruit; and then in the order of particularity follow “genera,” “sub-genera,” “species,” and “varieties.”

The limitation of what is strictly implied by the term “species,” in the animal and vegetable kingdoms alike, is still a vexed question with naturalists. Generally speaking, however, the term implies the resultant group, constituted by the issue of a single parent stock, and which has the power of reproducing their like and no other. The individuals of a species may vary in some essential points of structure; but still the offspring has the tendency of assuming a closer and closer resemblance to the original stock, if not prevented by external agency. In the plants of certain orders there occurs a remarkable tendency towards abnormal development of structural parts. Plants are then said “to sport.” The turnip, cabbage and kohlrabi—the sea colewort as well, which is found wild on certain parts of our coast—are all varieties of, and descended from, closely allied species; but their tendency towards “sporting” has been taken advantage of by man; and by the artificial means of agriculture, their abnormalities have been fostered to an extent rendering them valuable to the farmer. In the turnip the extra development, or hypertrophy, is seated in the root; in the cabbage, in the leaves; in the kohlrabi, in the stem. Cultivation has so

altered the functional action of these plants that in their first season's growth they do not develop flowers and seed, but store up a sufficient supply of nourishment in the hypertrophied parts for the basis of flower and seed growth during the following season. The rape and cauliflower plants are likewise descendants of nearly related stock; the abnormal development being seated in the leaf-stalks and leaves of the former, and in the flower-stalks of the latter. Varieties are producible by means of the artificial fertilisation of the seed of one plant through the application of pollen taken from the flower of some other particularly developed plant of the same species. In this way has been produced the countless varieties of wheat, barley, oats, and other cultivated plants. Hybrids can also be produced by fertilising the ovules of one species with pollen from the flower of another species. But, in common with the hybrids of the animal kingdom, these are incapable of reproduction.

All the grains and grasses of our annual crops belong to the order *Gramineæ*, which is one of the class *Endogenæ*; wherefore they are all endogenous stemmed, and their seed embryo is monocotyledonous. Wheat forms the genus *Triticum*; barley, *Hordeum*; oats, *Avena*; rye-grass, *Lolium*; and so on.

These genera are respectively subdivided into several species; these again into innumerable varieties. The bean, pea, and clover plants belong to the order *Leguminosæ*, of the class *Exogenæ*; and have therefore exogenous stems, and are dicotyledonous. The bean plant constitutes the genus *Faba*; the pea, *Pisum*; and the clover, *Trifolium*. To the class *Exogenæ* also belong the turnip, rape, cabbage, kohlrabi, and wild mustard plants, which with others constitute the order *Crucifera*, with its genera, species, and varieties respectively.

CHAPTER V.—*Of Animal Physiology.*

There are many striking points of analogy between animal and vegetable physiology. In point of fact, when we look at the elementary organisations in each great natural division, the boundary line between them is difficult to be drawn; and the forms are numerous, regarding which it is matter of debate as to which great division they properly belong. As we ascend to more highly-developed forms in either, the line of demarcation becomes more readily definable. The highest forms of plant life possess no nervous system, no cavity for the reception and digestion of solid food, in other words, no stomach; and they have no independent power of locomotion; all of which qualities, on the other hand, belong to the higher forms of animal life. Another cardinal distinction is that whilst plants can assimilate the elements necessary for building up and maintaining their structure from such simple or inorganic compounds as carbonic acid,

ammonia, and nitric acid, animal bodies, on the other hand can derive them from such complex organised compounds only as are formed by plants out of the simpler elements. This prepares us for the important fact, that all the actions of animal life consist in the liberation of heat or force attendant upon the disorganisation of the organic compounds forming the tissues. Consequently, every movement of the animal implies a consumption or using up of materials in its frame. Muscular action is the contraction and expansion of the delicate fibres composing muscle structure in obedience to nervous stimulus; and such contraction is caused by a liberation of atoms or molecules, and the resulting disorganisation or breaking up into simple compounds of the proximate substances composing the muscle fibres. Plants prepare their proximate constituents from the simple inorganic compounds by sun heat and light agency; whilst animals derive their possible existence from the liberation of latent force when these organised compounds are broken up. Plants also absorb carbonic acid and give off oxygen; animals inhale oxygen and exhale carbonic acid.

Nevertheless there are to be met with in the lowest scale of development forms of animal life devoid of stomach, nervous system, and independent locomotion; and also vegetable forms endowed with some degree of locomotion, and organs functionally resembling the stomach, and which do not obey the plant laws of exhaling pure oxygen and subsistence upon inorganic compounds.

As in the vegetable, so in the animal kingdom is it with regard to the fundamentally structural nature of the simple cell, created from a nucleus and the organic compound protoplasm by that mysterious agency hitherto only known and defined as "vital force."

The functions treated of in animal physiology come under the three heads of Nutrition, Reproduction, and Correlation, which last includes the consideration of the functions of sense and motion, or those by which the total organism is brought into relation with external nature.

Beginning in order, we find in all the more highly-developed classes an alimentary canal, into which is received food material, undergoing those processes which render it fit for assimilation. Then it is passed along the tortuous channel, where its nutritive elements are absorbed and thence conveyed to the blood, and at whose extremity the residuum of indigestible matter is excreted. The solid food when received into the mouth is broken up by the teeth, and mingled with saliva during mastication; and thus rendered into a pulpy mass easy to be swallowed, and prepared for stomachic action. Besides softening the food the saliva exerts certain chemical influences upon it; notably converting insoluble

amylaceous bodies into soluble saccharine bodies. The mass passes through the gullet, entering the stomach at the cardiac orifice. There it is acted upon by several secretions, the principal of these being the gastric juice, whose properties closely resemble those of hydrochloric acid. When the various compounds are nearly dissolved, they are passed on through the pyloric orifice of the stomach to the intestines in the condition called chyme. Chyme is a pasty substance, containing dissolved saccharine matter and undissolved starch, albuminous bodies broken up and wholly or partially dissolved, oleaginous bodies broken up but undissolved, such solid indigestible portions as have been enacted upon by the gastric fluids, and some of the liquids swallowed along with the solid food. The intestines, according to their diameter, are divided into the large and small. Continuing from the stomach, the small intestine is nominally distinguished as the duodenum, jejunum and ileum; and the large intestine as the cæcum, colon, and rectum. The latter distinction is less merely nominal, the rectum being less puckered or convoluted than the other two. At the union of large and small intestines occurs the ileo-cæcal valve, allowing a passage but one way from the small to the large.

Ere the chyme has entered far into the duodenum it is subjected to the action of the intestinal juices organised in various glands. Chief are the bile and pancreatic juices, secreted by the liver and pancreas respectively. These serve further to dissolve the albuminous compounds, of emulsifying or saponifying the oily constituents of the chyme, and of recommencing the conversion process of starch into sugar, which had been arrested by the gastric fluids. And thereby all are alike rendered capable of direct absorption. The chyme continuing its course through the intestines, has its available compounds absorbed and carried to the blood, and the insoluble, indigestible residue voided from the rectum.

At this stage it may be as well, before adverting to the processes of absorption and nutrition, to consider the constitution and circulation of the blood.

Like the sap of plants in its grand work of supplying all the animal tissues with the necessary food for health and maintenance, it has to discharge the additional functions of keeping up the animal temperature in every part, and of removing waste tissue substance and matter deleterious to life. Actually it consists of a colourless fluid containing innumerable minute globules,—“corpuscles,”—the greater part of which are red in colour, and give the blood its characteristic hue. Its fluid portion, the *liquor sanguinis*, is composed of the “serum,” holding fibrin and other compounds in solution. The fibrin exposed to the atmosphere has a tendency to coagulate, whence blood

clot. In the first stage of coagulation its total constituents appear as one jelly-looking mass, but in a little the serum oozes thence as a yellowish slimy fluid. The corpuscles, however, remain contained in the fibrin. The serum contains about 8 per cent. of albumen, and with the exception of the fibrin and the corpuscles, the whole constituents of the blood. Roscoe gives the following graphic formula as the average composition of the blood :—

Coagulum or Clot,	{	Fibrin	0.30	} 13.0
		Corpuscles	12.70	
		Water	79.00	} 87.0
Serum, . . .	{	Albumen	7.00	
		Fatty matters	0.06	
		Salts (inorganic)	0.94	
				100.0

The analysis of the inorganic or mineral matter remaining in the ash, by Enderline, is as follows:—

Phosphate of soda,	16.77
Chloride of sodium,	59.34
Chloride of potassium,	6.12
Sulphate of soda,	3.85
Phosphate of magnesia,	4.19
Oxide, with a little phosphate of iron,	8.28
Sulphate of lime, and loss,	1.45

The heart, by its continual alternate muscular contraction and expansion, keeps up an uninterrupted circulation of the blood through the whole animal frame. There are four cavities in the heart, two auricles and two ventricles. At either side of the heart respectively are an auricle and a ventricle. The auricle of the left side opens directly into the ventricle of the same side. And so is it at the heart's right side. But the whole course of the circulation intervenes between right and left auricles and ventricles respectively. The contraction then of the left auricle filled with blood forces it into the corresponding ventricle, which, at the same time, expands in order to receive it. Next, the contraction of the left ventricle throws its contents into the main arteries, forcing it along them into all their branches throughout the body, and into their capillaries as well—the minute vessels closely interlaced, which permeate all the corporeal tissues. From these delicate tubes the blood enters the veins, and through them is forced back to enter the heart's right auricle; whereupon is completed the systemic circulation, or that whereby every part of the body receives an unfailing constant supply of nutritive blood.

As in the former instance, the right auricle pumps the blood into the right ventricle, whence it enters the pulmonary artery, and through it the lungs. In the lungs it is exposed to the action

of the atmospheric air which they inhale, and having undergone the consequent important change of constitution it passes next into veins communicating directly with the left auricle, having thus completed the pulmonary circulation. The vessels leading from the ventricles are arteries; into the auricles, veins. Both orders of vessels are connected by means of the delicate capillaries so as to form a continuous channel. The blood is kept circulating in one direction by means of the valvular arrangement, which prevents the backward impulse when the auricles and ventricles contract. Blood suitable for the demands of tissue supply is the arterial blood only; when that function has been discharged it becomes venous blood. Thus the blood in the veins leading from the pulmonary circulation to the heart, and thence to the systemic capillaries, is arterial; the blood flowing into the right auricle, and thence through the right ventricle to the lungs, is venous. Arterial blood is of a bright scarlet hue; venous, dark purple. For which difference the reason would appear to be that, whereas the colouring matter, which contains a large proportion of iron, is fully oxidised in the case of arterial blood, in venous blood, on the other hand, it has parted with much of its oxygen during its passage through the capillaries into the veins.

Blood absorption consists in the taking up and conveyance of new material to supply the continual wants of tissue waste, and, in addition, the removal of this waste, which otherwise would effect the destruction of the parts throwing it off. The other absorbents besides the blood-vessels are the lacteals and lymphatics. The lacteals are confined to the intestinal canal; the lymphatics are distributed through all parts of the body where the presence of blood-vessels occurs. Both alike are connected with and pass through the lymphatic glands, which are supposed to have the power of further organising the compounds absorbed by the vessels. The absorption of substances received into the alimentary canal is effected by the blood-vessels and lacteals. Blood-vessels absorb all soluble matter, whether albuminous or saccharine, &c., directly through the enclosing membranes of the vessels. Hence, fluids and matter in solution can be absorbed by the blood-vessels before the passage of food from the stomach. The other two sets appear to have an affinity for particular substances. The lacteals chiefly absorb oleaginous substances, and their contents are then called chyle. In the intestines are numerous processes called villi, consisting of a network of minute blood vessels surrounding one or more lacteals, and all covered with mucous membrane like the other portions of the intestinal canal; and here it is that absorption principally takes place, although it does so more or less at all parts, even to the canal's extremity. It is still matter of doubt and conjecture as

to the exact source whence the lymphatics directly absorb their contents. They are supposed to absorb the excess of *liquor sanguinis* effused for nutritive purposes by the delicate capillaries into the tissues, and also such compounds resulting from tissue changes as are not totally excrementitious, but capable of further utilisation and absorption, after they may have been more highly organised and again carried into nutritive circulation, The nutritive substances being almost entirely absorbed by vessels leading into the veins, they are conveyed through several organs, which elaborate them into various compounds capable of being assimilated by the tissues before reaching the systemic circulation. The excrementitious compounds formed by tissue waste are absorbed by the blood-vessels, and these vessels leading into other organs capable of extracting all deleterious matter from the blood, the circulating fluid leaves them freed from waste and noxious compounds before it again permeates the different parts of the system. In further organising the absorbed nutritious compounds, the liver takes an important part, as also do the glands of the lacteals and lymphatics and the lungs as well. The principal agents in removing superfluous matter from the blood are the kidneys, lungs, liver, and skin. The kidneys secrete from the blood the excess of moisture, the waste albuminous substances, and nearly all the mineral salts in solution, all of which are conveyed from them to the bladder, and thence voided as urine. In the lungs the venous blood gets exposed to the oxygen there inhaled in the common air, and such blood greedily absorbs the oxygen. Carbon and hydrogen combine with it, and are exhaled with the expired breath as carbonic acid and watery vapour. The oxygen combines with the blood's colouring matter as well, and is readily yielded up by the latter to the tissues, in order that there may be effected the oxidisation and chemical change of their component substances. Besides its functions in the process of digestion and of organising compounds absorbed by the blood, the liver has to discharge the supplementary one as well of purifying the blood from the presence of certain bodies, which are for the most part compounds of carbon and hydrogen. The skin excretes gases and moisture—carbonic acid and watery vapour for the most part; but also minute quantities of compounds similar to those in urine, and this in the acts of sensible and insensible perspiration alike. Such compounds as those last mentioned are also to some extent exhaled from the lungs.

The principal bodily excretions are urine and the fæces, which, committed to the soil, are still of value for the purposes of plant life. Urine, as we have seen, chiefly contains disorganised albuminous compounds and inorganic salts. Summarily, the different compounds of fæces may be stated to be those which have been

taken into the body with the food and carried through it, without having been assimilated. Unless there is consumption of food rich in albuminous matter, or the latter is present in the former in an indigestible state, the feces contain but a small proportion of nitrogen. The principal constituents are unassimilated inorganic salts.

To epitomise, alimentary substances are introduced into the stomach, there to be broken up and dissolved, and passed thence into the intestines, where they are still more completely fitted for assimilation by the action of the absorbents. The saliva changes insoluble starchy matters into soluble saccharine compounds, until this process is arrested by the gastric fluid; but the fluids from the liver and pancreas renew the arrested operation when such matters have been passed into the intestines. The albuminous compounds are in considerable part dissolved by the gastric fluids; those passing from the stomach undissolved are further acted upon by the intestinal fluids. The oleaginous compounds are broken up, but are otherwise unacted upon by the gastric fluids. When subjected to the action of the bile and pancreatic fluid, they are broken up into minute globules covered by albuminous matter. The more solid and fibrous parts of the food but little altered by these agencies are passed on to the rectum, and thence defecated together with the remaining unabsorbed materials. The blood-vessels ramifying through the inner coats of the stomach at once begin to absorb all soluble compounds—saccharine, albuminous, and inorganic—which can penetrate the enclosing membranes of the vessels. These absorbed compounds are passed together with the venous blood through the several elaborating and secreting organs, there to be prepared for assimilation in the tissues. The compounds resulting from muscular action and the breaking up of tissue substance are in part absorbed by the lymphatics, but principally by the blood-vessels. The compounds absorbed by the lymphatics are supposed to be such as are not entirely excrementitious, but still further capable of organisation and assimilation. The blood is purified from all used up or unnecessary compounds during their passage through the various excretory organs.

Albuminous compounds pass by the several names of flesh formers, or of proteine, plastic, and azotised, *i.e.*, compounds containing nitro gen. Before absorption they are converted into a compound named albuminose, which in the blood soon assumes the forms of albumen and fibrin; the blood then circulating in the capillaries effuses through their enclosing cellular membranes into the tissues its fluid and gaseous contents; whereupon the albuminous compounds go to build up and replace such bodies as the fibrin and albumen contained in the muscular fibre of flesh, the casein in milk, the gelatin in the bones, ligaments, horns, hoofs,

hair, wool, &c., and chondrin in cartilage or gristle. The oleaginous compounds, or fat formers, supply material for storing up fat in the system. The adipose or fat cells are congregated in nearly every part of the system. In the case of animals fattened beyond natural requirements these cells are deposited in increased quantity in all the soft tissues, thus increasing the size and plumpness of the different parts of the frame; but at the same time their presence greatly interferes with the continuance of muscular vigour. They are also termed heat producers, as by the oxidation of their carbon and hydrogen in the lungs and tissues they serve to maintain the requisite temperature of the blood. The amylaceous and saccharine bodies are termed the respiratory or heat-producing compounds. Their carbon and hydrogen are oxidised in the lungs and other parts, and carbonic acid and water produced thereby, as in the case of the last-mentioned compounds. It is supposed that their excess in the blood is capable of conversion through exchange of atoms into fatty material. As before mentioned, the production of heat ensues upon all movements whatever of animal bodies. The oleaginous and amylaceous compounds alike are incapable of supplying flesh-forming materials, the reason being that they do not contain nitrogen.

There is a peculiar modification of stomach represented amongst the ruminant animals of the farm, those, namely, which are commonly said to "chew the cud." The stomach in their case is divided into four different compartments, viz., 1st (in order from the gullet), the rumen, or "paunch;" 2d, the reticulum, or honeycombed bag; 3d the omasum, or "manyplies;" and 4th, the abomasum, or stomach proper. The gullet or œsophagus is continued to the third stomach; but in passing over the openings into the rumen and reticulum, it is slit in such a manner that a small amount of pressure opens its folds, and affords a passage into those two divisions. In the act of feeding, ruminant animals, it will be seen, swallow their natural food before it is thoroughly masticated. This, in being swallowed, deposits its bulkier and more imperfectly chewed portions into the rumen and reticulum, through the pressure of such portions upon the two folded openings into the same respectively, the larger pieces naturally entering the rumen. And there it remains, and is acted upon by the saliva swallowed along with it, until the animal ceases browsing. Meanwhile the reticulum has been receiving the supply of the rumen. When the animal, in the next place, commences to ruminate, the contents of the reticulum are ejected through the folds of its communicating aperture into the gullet in the form of small pellets, and by an inverted muscular action of the gullet these are conveyed to the mouth, where they undergo a thorough leisurely mastication. Reduced by this

process to a soft pulpy mass, its second passage down the gullet is unaccompanied with the requisite amount of pressure to open the passage into its former receptacles, and it passes easily and smoothly to the omasum. In like manner almost all fluid, softish or gruelly food, passes directly to it in the first instance. It may almost be said that the gullet is continued through the omasum into the fourth stomach. The inner coats of the omasum are arranged as a great number of closely-placed folds, and any substance imperfectly reduced, or triturated, so to speak, passing along the continuation of the gullet, becomes perfectly reduced, having to pass between these folds or "manyplies" before entering the abomasum. Here finally, where is secreted the gastric juice, does digestion proper commence. The abomasum leads directly into the duodenum.

Here, inasmuch as poultry form in many instances an important branch of the live-stock of the farm, it may be as well briefly to advert to the characteristic modification of the digestive portion of their alimentary canal. Midway between mouth and stomach is situated the ingluvies or crop, a pouch formed by folds or a species of dilatation of the gullet; and here the grains and similar hard food swallowed entire are stored up in the first instance. The food is gradually passed to the gizzard, where it is crushed and ground up between the muscular sides of this organ, which are lined with horny membrane. Its peculiar action is greatly aided by the presence of the sand and minute stones which the fowl instinctively swallows. The "proventriculus," or stomach proper, has to be passed through, however, before the food enters the gizzard. In the former is secreted the gastric juice, whence it is that the food is subjected to its influence before being triturated by the gizzard's action. The gizzard opens into the duodenum.

With regard to the reproductive process in animals, the principal organs for producing and developing the embryo in the female are the ovaries, in which are developed germ cells or ova, and the uterus or womb, where the ova are impregnated by the male animal, and where the ova are afterwards developed and sustained by the blood of the mother until they are ripe for parturition. There are two ovaries, one on either side, and they are situated in the region of the loins. They communicate with the uterus by the Fallopian tubes, which are certain very narrow channels. The ova, produced at periodical intervals, pass through these tubes to the uterus, and their presence in that organ is made evident by the phenomenon of "heat" or "rut" in the female. If sexual intercourse, and the impregnation of one or more ova, do not supervene, the ova are soon discharged from the body. In the opposite event the ovum is retained in the womb, and there sustained by union with the maternal blood circulation

through the successive stages of embryonic growth, up to the stage when it can maintain its separate existence as a fully developed animal of the species; whereupon the union is broken and the young animal expelled from the mother's body by a wonderful muscular action of the uterus. Until able to provide for itself, the young animal is fed with the mother's milk, elaborated from the blood by her mammary glands. The testes in the male animal are the corresponding organs to the ovaries; they secrete the seminal fluid, containing sperm cells,—spermatozoids,—which being discharged during the sexual act, and coming into contact with the ova, serves to fertilise the latter. By castration, or the removal of the testes, the male animal is rendered incapable of performing his share of the reproductive process, but at the same time he becomes more docile in disposition, and he is more easily and economically fattened than he could have been before the deprivation. The female when deprived of the ovaries assumes the like characteristics. In the case of fowls the ova, whether fertilised or not, are expelled from the body in a complete state in the form of eggs. They contain within the shell a thick layer of nutritious albuminous matter,—the “white,”—which affords nourishment, when impregnation has been effected, to the growing embryo during the period of incubation.

The physiological functions of correlation hardly fall within the scope of such a work as the present.

CHAPTER VI.—*Of Meteorology.*

The atmosphere, or aerial rind enclosing our globe, is composed of a mixture of oxygen and nitrogen, and a small proportion therein of one or two other gases. Purified air consists of 4 volumes or 77 parts by weight of nitrogen, and 1 volume or 23 parts by weight of oxygen. But common air also contains a considerable quantity of watery vapour, and carbonic acid as well, the latter in the proportion of about 4 volumes to 10,000 volumes of air; and 1 part of ammonia to 1 million parts of air. Nitric acid is also present, but in minuter quantity than ammonia. The height to which it continues above sea-level is uncertain, and variously estimated at from 45 miles upwards. At the sea-level its average pressure upon all objects is at the rate of 15 lbs. on every square inch, and it can support a column of mercury 30 inches high in a tube *in vacuo*, whose only open end enters the mercury contained in an open vessel. Such an arrangement constitutes the invaluable instrument, the barometer, the measurer of atmospheric pressure, and as such, an indefinite multiplier of science. Aerial density gradually diminishes as we ascend above the sea-level, and with it aerial pressure as well. Heat expands air, which decreasing in density, ascends; its

vacant place being occupied by a fresh supply possessed of the normal coldness and density. Hence the origin of the winds, and the constant atmospheric movements round the earth. The constant ascent in this manner of the body of air superincumbent upon the tracts of ocean, having a breadth of belt extending to one or two degrees on either side the equator, and the supply of colder air to fill up the vacuum, combine to effect the beneficial phenomenon of the steady trade winds. And their prevailing direction is consequent upon a supplementary fact, viz., the greater speed of terrestrial revolution at the equator, arising from the earth's increased diameter at that part; for this swifter easterly motion than at other parts of the earth's surface makes the trade winds fall behind, so to speak, and to seem blowing from the north-east and south-east. To the irregular occurrence of partial aerial rarefaction is due the phenomena of monsoons, and all winds great and small. From water, moisture evaporates at all temperatures, even when it is in the form of ice or snow; and the air has the property of being able to hold a large quantity of such aqueous vapour in suspension. The higher the temperature of the atmosphere, the larger the proportion of aqueous vapour it can absorb; therefore it possesses various degrees of saturation, *i.e.*, points beyond which it can hold no more in suspense. As air becomes cooler, so does its power of saturation also become lowered; whereupon all the watery vapour in excess is condensed, and falls as rain, or is deposited as dew. Dew is produced by the rapid radiation of heat from the warm surface-ground and herbage after sunset. These becoming cooler than the immediately surrounding air, the latter in turn parts with its heat to them by radiation, whereby it has its saturation point lowered, and the excess of vapour becomes deposited as dew. And so with fogs and mists; they result from the radiation of heat from land and water, taking with it aqueous vapour, which becomes visible upon encountering cooler air. Similarly, rain is produced when heated volumes of air are deprived of their heat, through the fall of condensed vapour, which assumes, according to the temperature it encounters, the form of rain, hail, or snow. The following table gives the weight in grains of a cubic foot of vapour at successive ascents of 10°, from 0° to 90° Fahrenheit, clearly demonstrating the increase of the saturation point with the rise of temperature:—

Temperature in degrees.	Weight in grains.	Temperature in degrees.	Weight in grains.
0	0·856	50	4·535
10	1·208	60	6·222
20	1·688	70	8·392
30	2·361	80	11·333
40	3·239	90	15·005

“When by any cause the temperature of the air is reduced, its particles (molecules), approach nearer each other, and so do those of the vapours held suspended in the air; and as steam becomes visible when mixed with atmospheric air, so vapour becomes visible when it suffers condensation by a reduction of temperature, and then becomes *clouds*. These differ much in altitude and size.” In this way we can visibly perceive the contained watery vapour in our lung exhalations during frosty weather, as also at such times as the atmosphere is already saturated with moisture.

On this natural provision of the aerial absorption of moisture depends the entire system of circulation of water from earth to sea, and *vice versa*. From the immense tracts of the tropical seas, and those of less heated zones, enormous volumes of water are being continually uplifted into the thirsty air. And this saturated air, becoming impelled in every direction by all the winds that blow, meets with cold elevations and land surfaces, or colder currents; whereby, losing its excess of temperature by means of radiation, its corresponding excess of moisture is condensed, and descends as rain to promote vegetable life, to fill our springs, rivers, and lakes, and take a leading part in effecting the physical and chemical changes which are constantly occurring, and altering the general contour of the world.

The frequency rather than the amount of rainfall, indicates the atmospheric humidity of any district. Generally speaking, the number of days in a year on which there falls rain, *increases* as we recede from the equator to the temperate zones; and the amount of rainfall *decreases* with distance from the equator with increased elevation above sea-level, and with distance from the sea:—

From N. lat.	12° to 43°	there are	78	rainy days.
”	”	”	43 to 46	” 103
”	”	”	46 to 50	” 134
”	”	”	50 to 60	” 161

The rainfall of the tropics is estimated at 95, and of the temperate zones at 34 inches annually. In some parts of the West Indies, as much as 600 inches have fallen in one year.

In the comparatively small area of Great Britain there is yet large diversity of the amount of rainfall, humidity, and temperature of the atmosphere. This, besides being due to local physical causes, arises from others prevailing over a large portion of the earth.

In some districts sheltered by higher ground from unfavourable winds, the temperature is much higher than it is in less favoured districts, and from the condensing action of the hills, the humidity is also greater. The prevailing westerly winds come moisture-laden from the Atlantic into contact with the

colder surface of the western parts of our islands; they become lowered in temperature, and consequently part with much of their moisture at the place of contact, in the form of mists and rain; and thus they keep these parts at once warmer and more humid than the eastern districts of the kingdom. Such influences have, by necessity, a considerable bearing upon the question as to the preferable system of agriculture for adoption in these districts respectively. For whilst the possession of an atmosphere humid to excess, with its attendant want of frequent sunshine, renders certain districts incapable of properly maturing our more valuable cereal crops, they are at the same time better fitted for the cultivation of the important green crops, and thereby better calculated for the successful practice of the several systems of stock-farming than other, in some respects, more highly favoured counties.

The following remarks of the English Registrar-General are of interest in this connection. He says:—"Rain fell in London to the amount of 43 inches, which is equivalent to 4300 tons of rain per acre. The rainfall during last week" (February 1865) "varied from 30 tons per acre in Edinburgh, to 215 tons per acre in Glasgow. An English acre consists of 6,272,640 square inches, and an inch deep of rain on an acre yields 6,272,640 cubic inches of water, which at 277,274 cubic inches to the gallon makes 22,622·5 gallons; and as a gallon of distilled water weighs 10 lbs., the rainfall on an acre is 226,225 lbs. avoirdupois; but 2240 lbs. are a ton, and consequently an inch deep of rain weighs 100·993 tons, or nearly 101 tons per acre. For every 100th of an inch, a ton of water falls per acre. If any agriculturist were to try the experiment of distributing artificially that which nature so bountifully supplies, he would soon feel inclined to rest and be thankful."

Numerous experiments have satisfactorily demonstrated that the amount of water exhaled by the plants on an acre of ground is in excess of its amount of rainfall. As therefore nearly 2-5ths of the total rainfall are carried away by the drainage, it will be better judged to what an extent takes place an almost insensible circulation of water from earth to atmosphere and reversely.

The atmospheric temperature decreases as we approach the higher latitudes from the equator, and also with increased elevation above the sea-level. For every 300 feet of ascent above the sea-level the mean or average temperature decreases 1°. But with increasing distance from the equator there is no uniform gradient of decrease, owing to the unequal distribution of sea and land and other causes producing a variation of temperature in parts of the world included in the same degrees of latitude. The lines which cover tracks of the world having the same mean temperature are called "isothermal lines." The atmospheric

temperature is measured and indicated by the thermometer, which contains mercury or fluid in a closed glass tube, from which the atmospheric air has been extracted. Its contents expand and contract under the influence of heat and cold; and the amount of these respectively is indicated by the standard scale of degrees according to which the instrument is graduated. They are also constructed with an arrangement for registering the maximum amount of cold which has been reached during any fixed period. The hygrometer indicates the amount of moisture contained in the atmosphere immediately surrounding it; whilst the hygro-scope again merely indicates its presence. Anemometers are instruments used for measuring the amount of the wind's force and velocity. As exhibiting the influence of temperature upon the distribution of plant life in the earth, we find the face of the globe in physical atlases, from the equator to the pole, roughly divided into eight isothermal zones, with characteristic plants, as follows:—

1st, The region of palms and bananas—Equatorial zone—equator to lat. 15° from max. temp. to 78°				
2d, " " " tree ferns and figs—Tropical zone—lat. 15° to lat. 25°—mean temp. from 78° to 78°				
3d, " " " myrtles and laurels—Sub-tropical " — 25° " 34°— " " 73° " 62°				
4th, " " " evergreens —Warm temp. " — 34° " 45°— " " 62° " 53°				
5th, " " " European trees —Cold temp. " — 45° " 58°— " " 53° " 42°				
6th, " " " pines —Sub-Arctic " — 58° " 67°— " " 42° " 35°				
7th, " " " rhododendrons —Arctic " — 67° " 72°— " " 32° " 28°				
8th, " " " Alpine plants —Polar; " — 72° " 90°— " " 16° " 1°				

The same applies to the vertical isothermal lines, *i.e.*, those indicative of similarity of temperature in distance above sea-level. We can see the effects of temperature on the choice of cultivated plants exemplified within the limited area of our own country, in the presence and absence of certain field crops, as we travel from the southern to the northern extremity of our island. The important bearing which the science of meteorology brings more immediately upon agricultural practice has until recently been almost entirely overlooked; but now its principles, and their connection with the flourishing of farm crops and the welfare of live-stock, are more entirely appreciated. And there is all the more reason for this, from the peculiar situation of our kingdom subjecting it to numerous, extreme, and sudden changes of weather. The farmer can now, at the same time, more successfully combat with these, through the agency of the widely-disseminated weather-charts and forecasts, the fruits of the system so admirably organised by the Government department of the Board of Trade.

CHAPTER VII.

Of the Leading Scientific Principles of the Art of Agriculture.

The perusal of the foregoing chapters will have prepared the student for tracing the relation of the various physical sciences

therein successively treated of, to the leading principles of agriculture, as they will next be practically adverted to in the remaining portion of this manual.

The classification and the chemical and physical characteristics of soils will fall to be considered by way of preliminary matter, seeing that the soil is the primary essential requisite for affording the plant a foundation on which to begin the formation of its structure, and, at the same time, in connection with the atmosphere, supplies all the elements necessary for the plant's growth. And before doing so a brief recapitulation is expedient of the plant's mode of absorbing its organic and inorganic constituents.

The plant is but little dependent on the soil as a source of carbonic acid supply, as it is the carbon of the atmosphere which it is constantly absorbing and assimilating. Still, a considerable quantity of the atmospheric carbon is being carried into the soil when the former is dissolved by rain water. And when it is there freed by chemical action a proportion of it is directly absorbed by roots. Water necessary to the plant, yielding oxygen and hydrogen, the roots can absorb; and likewise, in some measure, the leaves, when the air is damp. Nitrogen, although existing free to so large an extent in the atmosphere, is not available for plant life in equal measure with these other three inorganic elements. It is only to a limited extent that plants can absorb the nitrogen of the atmosphere; and then it is the ammonia and nitric acid it contains and only from the ground as a source, into which, both being soluble in water, they are carried by the rain. On this point Liebig says:—"As regards the quantity of ammonia thus brought down by the rain, . . . as 1132 cubic feet of air, saturated with aqueous vapour, at 59° Fahrenheit, should yield 1 lb. of rain water, if the pound contain only 1-4th of a grain of ammonia, a piece of ground of 26,910 square feet—43,560 square feet being an acre—must receive annually upwards of 80 lbs. of ammonia, or 65 lbs. of nitrogen; which is much more nitrogen than is contained in the form of vegetable albumen and gluten in 2650 lbs. of wood, 2500 lbs. of hay, or 200 cwt. of beetroot, which are the yearly produce of such a piece of ground; but it is less than the straw, roots, and grain of corn which might grow on the same surface would contain." Other chemists, however, calculate the amount of nitrogen carried by rain to the soil at a much lower figure than the Baron does. *Humus*, or the organic matter of soils, absorbs ammonia from the atmosphere, and when existing free in the soil; in like manner does clay. Nitric acid and ammonia are also produced in the soil by the decay of animal and vegetable substances containing nitrogen. The former combines with bases, such as potash, soda, or lime, to form nitrates; and these and the ammonia become absorbed by the clay or humus. It is

understood that plants absorb the liberated ammonia in a direct manner, and nitric acid in the same way; although in regard to the latter the question is more undecided. These, accordingly, are the natural sources whence plant life obtains the necessary organic elements of carbon, hydrogen, oxygen, and nitrogen. The inorganic compounds, whence are derived the inorganic elements necessary for the upbuilding of plant structure, exist in the soil in, as we have seen, an almost insoluble condition. But rain water holding carbonic acid in solution has, we know, its soluble power over such compounds in the soil vastly increased. But even with this, and the additional fact of so large a quantity of it permeating the soil and plant structure (experiment has shown that for every grain of inorganic matter assimilated by a plant, 2000 grains of water have passed through the latter), still plant life could not derive inorganic substance in sufficient quantity, without the additional agency of the power stated to be inherent in roots, of contributing by chemical or other means to the solubility of the compounds of this class with which they come into contact in the soil. By heat and light these several absorbed compounds, when exposed in the leaf or elsewhere, are broken up, and their atoms and molecules rearranged, to form the proximate and other compounds found in plants.

The several constituents of plant life "all form," says Johnston, "more or less constantly and abundantly a portion of the fixed and solid matter of the plant taken as a whole. They may not be found in any one part of the plant when separated carefully from the rest; but in the solid parts of the plant, taken as a whole, they are all and always to be met with. When thus deposited they become, for the most part, dormant, as it were; and for the time cease to perform an active chemical function in the general growth; though, as vessels or cells, they may still perform a mechanical function. They undergo various chemical changes in the interior, chiefly while circulating or contained in the sap, by which changes they are prepared and fitted for entering, when and where it is necessary, into the composition of the solid or fixed parts of the plants. Thus the starch of the seed is changed into the soluble dextrin and sugar of the young plant, and then again into the insoluble cellular fibre of the stem or wood as the plant grows; and finally, into the insoluble starch of the grain as its seed fills and ripens. They each exercise a chemical action more or less distinct, decided, and intelligible upon the other elementary bodies, and the compounds of them, which they meet with in the sap of the plant. In regard to some substances, such as potash and soda, the sulphuric and phosphoric acids, this last function appears to be especially important. These substances influence all the chemical changes which go on in the interior of the plant, and which modify or cause its growth.

The same is true of the nitrogen which the plant contains. This elementary body, in the form of albumen, or some other of the numerous protein compounds which occur in the sap, presides over, or takes part in, almost every important transformation which the organic matter of the living vegetable undergoes. Thus it is always abundantly present when the starch of the seed or of the tuber is dissolved and sent up to feed the young shoot; and again, when the soluble substances of the sap are converted into the starch of the grain of the tuber, or of the body or pith of the tree, one or other of the protein combinations is always found to be present on the spot where the chemical change or transformation is going on. Besides these general functions, the several substances found in plants exercise also special functions in reference to vegetable life and growth. Thus, *nitrogen* is most abundant in the sap of young plants, takes part in most of the changes of organic compounds which go on in the sap, and fixes itself, as the plant approaches maturity, in greatest abundance in the seeds and in the green leaves. Nitrogenous manure alone produces negative results. *Potash* and *soda* circulate in the sap, influence chemical changes very much, and reside or fix themselves most abundantly in green and fleshy leaves, and in bulbous roots. *Sulphuric acid* is very influential in all chemical changes, is found in most cases in those parts of the plant in which soda and potash abound, and deposits a portion of its sulphur wherever the compounds of nitrogen form a notable part of the substance of the plant. *Phosphoric acid* exercises also much influence over the chemical changes of the sap, and finally fixes itself in greatest abundance in the seeds and other reproductive parts of the plant. Soluble phosphates, from whatever source derived, produce no difference, whether as dissolved guano, coprolites, or bone ash. *Lime* is very important to healthy vegetable growth, as practical experience has long testified. Among other duties, it appears to accompany the phosphoric acid in the sap of plants, and to deposit itself in combination with organic acids in the leaves and bark, and with phosphoric acid in some seeds and roots. *Magnesia* appears also to attach itself very much to phosphoric acid in the sap, and fixes itself in combination with the acid principally in the seed. *Chlorine*—the chemical function of this substance in the sap is less understood even than that of the other substances above-mentioned. It exists chiefly in combination with soda, and is much more abundantly present in some plants, and in some parts of plants, than in others. Though, as I have said, its immediate chemical function in the plant is not understood, it forms a most important constituent of the plant, in so far as the after uses of vegetables in the feeding of animals are concerned. *Silica* exists in the sap in a soluble form, and deposits itself chiefly in the exterior

portions of the stems and leaves of plants. It is supposed there to serve as a defence to the plant against external injury, and to give strength to the stem in the case of the grasses and corn-yielding plants; but what chemical functions it performs, if any, in directly promoting vegetable growth, we can scarcely as yet even venture to guess."

The following analysis of a good arable light sandy loam by Anderson will give an idea of the manner in which the several elements are combined in the soil, although the several salts are broken up into their component acids and bases:—

Soluble Matter.	{ Organic matter,	5.53	Brought forward,	745.02
	{ Peroxide of iron,	0.37	Magnesia,	27.71
	{ Lime,	0.36	Potash,	221.05
	{ Magnesia,	0.49	Soda,	3.48
	{ Potash,	1.25	Chloride of sodium,	20.66
	{ Chloride of sodium,	2.91	Phosphoric acid,	37.77
	{ Phosphoric acid,	0.72	Sulphuric acid,	5.94
	{ Sulphuric acid,	4.43	Silicic acid,	52.68
	{ Silicic acid,	8.02	Organic matter,	576.61
	{ Peroxide of iron,	427.02	Insoluble silicata,	7988.62
	{ Alumina,	260.15	Moisture,	320.46
	{ Lime,	33.77		
	{ Carry forward,	745.02		10,000.00

Soils.

From the difficulties which attend the obtaining of complete analyses of soils, no large amount of attention has hitherto been devoted to this branch of agricultural chemistry, except in instances where the object has been to determine the quality of some of the more important and indispensable constituents, such as lime. It will easily be granted, what a variety the analyses of different soils must present. The width of variation must be obvious, which exists between the composition of the soil of a chalky district and of soil taken from a reclaimed peat-moss. And again, whilst the analyses of two soils may show an almost identical composition, their measure of fertility may still be very unequal, owing probably to the soluble nature of the components of the one, and the different conditions of combination, and lessened degree of solubility prevailing with the constituents of the other.

In connection with the analysis last above given, the following table, extracted from Stephens's "Book of the Farm," give the amount of ash or inorganic material taken from the soil by some of our cultivated plants—the quantity being for every 100 lbs. of each plant:—

100 lbs. of	A.—By Grain Crops.		
	Grain.	Husk.	Straw.
Wheat, . . .	1·2 to 2·0	...	3·5 to 18·5
Barley, . . .	2·3 „ 3·8	...	5·2 „ 8·5
Oats, . . .	2·6 „ 3·9	5 to 8	4·1 „ 9·2
Rye, . . .	1·0 „ 2·4	5 „ 8	2·4 „ 5·6
Rice, . . .	0·9 „ 0·7	14 „ 25	...
Indian corn,	1·3	...	2·3 „ 6·5
Buckwheat,	2·13	...	...
Field beans,	2·1 „ 4·0 (?)	...	3·1 „ 7·0
		Pod.	
„ pease, . . .	2·5 „ 3·0	7·1	4·3 „ 6·2
Vetches, . . .	2·4	...	...
Linseed, . . .	3·8 „ 4·63	...	...
Flax-seed, . . .	4·5	...	1·28
Hemp-seed, . . .	5·6	...	1·78
Mustard-seed,	4·2 „ 4·3	...	...

B.—By Root and Leaf Crops.

	Roots or Tuber.		Leaves.	
	Undried.	Dried.	Undried.	Dried.
Potato, . . .	0·8 to 1·1	3·2 to 4·6	1·8 to 2·5	18 to 25
Turnip, . . .	0·6 „ 0·8	6·0 „ 8·0	1·5 „ 2·9	14 „ 20
Beet, . . .	...	6·3	...	...
Carrot, . . .	0·7	5·1	...	16 „ 42
Parsnip, . . .	0·8	4·3	...	15 „ 76
Mangold-wurzel,	1·1	7·0	0·53	7 „ 55
Cabbage, . . .	...	...	...	18 „ 26

C.—By Grasses.

	Green.	Dry.
Lucerne, . . .	2·6	9·5
Red clover, . . .	1·6	7·5
White „ . . .	1·7	9·1
Rye grass, . . .	1·7	6·0
Knot grass, . . .	...	2·3
Holcus lanatus, . . .	...	5·6 to 6·8
Poa pratensis, . . .	...	6·2
Scirpus, . . .	...	2·3

From these tables we perceive what a small percentage of the weight of plants is contributed by the inorganic materials of the soil.

Clay and sand are the two substances which determine the texture of the soil; and to the variety of their admixture, in regard to their respective proportions, are due the different classes of soils. The following classification of soils, as proposed by Johnston, may be selected as being the simplest, and that one, at the same time, by whose standard the classification of any particular soil may most easily be determined.

The purest clay, such as pipe-clay, found naturally, consists of silica, alumina, and a small quantity of oxide of iron, in chemical combination. No sand can be extracted from it. Tile clay,

the *strongest of soils*, consists of pure clay, mixed with from 5 to 15 per cent. of siliceous sand; this can be separated from the clay by boiling, or otherwise thoroughly incorporating the clay with water, and then allowing the mixture to settle. The sand settles first, and the liquid can be poured off just as the finely divided clay begins to be precipitated at the bottom of the vessel.

A *clay loam* permits of from 15 to 30 per cent. of fine sand to be separated from it in this manner.

A *loam*, from 30 to 60 per cent.

A *sandy loam*, from 60 to 90 per cent.

A *sandy soil* contains no more than 10 per cent. of clay.

A *marly soil* is one on which the proportion of lime contained ranges from 5 to 20 per cent.

A *calcareous soil* is one where the lime exceeds 20 per cent.

Vegetable moulds have their range from the garden mould, containing from 5 to 10 to the peaty soil in which the organic matter may amount to 60 or 70 per cent.

The last three classes of soils are also clayey, loamy, or sandy, according to the description of the predominant element of the admixture. This organic matter or *humus* springs, as we have seen, from vegetable decay. When abundant, as in the case of peaty soils, it is inactive, and inorganic matter is deficient in quantity. But after drainage, and in regular cultivation, humus rapidly decays, and gets used up till the subsoil is reached and incorporated with the remaining humus, when there is found a more normal soil.

The amount of humus persistent in our cultivated soils is rarely less than 5 per cent. Chemically, it is a mixture of several acids, varied according to its stages of decay, all composed of carbon, hydrogen, and oxygen. It is not considered to be a direct source of food to the plant, but it is of great importance as a chemical agent for effecting changes in the soil. As previously mentioned, it absorbs ammonia from the atmosphere, and when free in the soil, and also soluble alkaline compounds, thereby preventing their being washed out of the soil; and at the same time so retaining them, that they can easily be liberated and absorbed by the plant roots. It likewise absorbs oxygen from the atmosphere, and freeing it in the soil, maintains a constant chemical action amongst the several constituents. Clay possesses similar absorbent properties, and its presence is therefore of considerable value, when not so intrusive as to impede the exercise of proper cultivation.

With regard to the matters carried away in solution by that portion of the rainfall which is drained out of the soil, Prof. Anderson, in commenting on the analyses of different drainage water from various soils—the rainfall estimated at 25 inches—

by Way and Krocke, says:—"It appears that about $\frac{2}{3}$ of all the rain which falls escapes through the drains, and the rest is got rid of by evaporation. An inch of rain falling on an imperial acre, weighs rather more than a hundred tons; hence, in the course of a year, there must pass off by the drains about 1000 tons of drainage water, carrying with it, out of the reach of the plants, such substances as it has dissolved, and 1500 tons must remain to give to the plant all that it holds in solution." (It has been already stated, however, that the amount of moisture inhaled by the plants covering an acre of ground alone exceeds the rainfall on such an area.) These 1500 tons of water must, if they have the same composition as that which escapes, contain only $2\frac{1}{2}$ lbs. of potash and less than 1 lb. of ammonia. It may be alleged that the water which remains, lying longer in contact with the soil, may contain a large quantity of matter in solution, but even admitting this to be the case, it cannot for a moment be supposed that they can ever amount to more than a very small fraction of what is required for a single crop. It may, therefore, be stated with certainty that solubility in water is not essential to the absorption of substances by the plant, which must possess the power of itself directly attacking, acting chemically on, and dissolving them. The mode in which it does this is entirely unknown, but it, in all probability, depends upon very feeble chemical action, and hence the importance of having the soil constituents, not in solution, but in such a state that they may be readily made soluble by the plants," viz., with the particles in a finely divided state. The nitrates being the most soluble salts are washed out most abundantly,

We speak of soils as being *stiff*, *tenacious* and *heavy*, when they are difficult to cultivate by means of the ordinary farm power; *sharp* and *free* when they are of a gritty texture, and easily pulverised; *deaf*, when of a spongy, inactive texture, as when the soil adheres to the iron of the plough and other implements; *deep*, when they can be deeply furrowed and stirred without the subsoil being reached; *thin*, in the opposite case; *retentive*, when they retain the surface water, and admit only of its slow percolation downwards; and *porous* when the reverse takes place. Such other terms are applied, as rich, poor, hungry, grateful, kindly, and so on, according to the degree of natural fertility in soils, the readiness with which they absorb and retain manurial matter added to them; or, on the other hand, with which they part with it unused, or their possession, or want of other such like obvious properties.

Black soils are to be seen in peaty, white soils in chalky districts. Red soils are frequent, and for the most part they are very fertile. But the prevalent tint is a brownish one. Black, dark-coloured soils reflect the solar rays less, and consequently

absorb more of their heat than do the whitish, light-coloured sorts ; but from their property of radiation, they part with heat more quickly than do the latter. Soils, exposed to the sun's hottest rays at right angles, absorb more heat than if otherwise situated. Clay soils, and such as have an excess of humus, absorb more moisture and keep it longer than do sandy soils, and such as contain a less proportion of organic matter.

Drainage.—To the end that cultivated plants may flourish, it is absolutely necessary that the soil be relieved from the presence of stagnant water ; for the presence of such water, besides continually lowering the temperature of the soil, by the constant demands it makes upon the soil's heat in the act of evaporation, also precludes the possibility of air circulation through the soil's component particles. The first step, accordingly, in good husbandry, when the soil is not naturally dryish, is its artificial drainage ; which process having been effected, and the rain water now percolating through the soil into the drains, and only so much of it as is retained in the soil by capillary attraction becoming evaporable, the soil being thereby deprived of less heat, has its temperature raised considerably, promotes the earlier germination of seeds, and brings all the crops grown upon it to a speedier maturity. Land is also thus rendered capable of being worked at times and seasons in which it was formerly unworkable, and always with a less expenditure of labour. The common ways of constructing the underground ducts of drainage works in agriculture are sufficiently familiar. Clay pipes of varying shape and bore, and laid continuously in parallel rows, are usually employed, though in certain districts recourse is had to flat stones, so arranged as to form a channel with triangular-shaped bore. The surplus water then percolates the soil, and meeting the drains, leaks or soaks through the joints imperfectly fitting of the clay or stone conduits, and by gravitation it is carried through these to some clear outlet.

The Rotation of Crops.

In like manner, as the strength of any mechanical chain is regulated by its weakest link, so may the fertility of any given soil be said to depend (other conditions being favourable) on that one essential element or compound which is present in it in the least quantity of all. To the recognition of this, and the additional ascertained fact, that some plants require a greater amount of particular elements or compounds than others do, is due the custom, in agricultural practice, of observing a "rotation" or varied succession of crops, whereby it is possible to obtain permanently a maintenance of the proper balance of the soil's constituents. The annexed table, composed by Baron Liebig, in which the whole inorganic materials assimilated by

plants are included under the three heads of salts of potash and soda, of lime and magnesia, and of silica, bears out the fact:—

		Salts of Potash and Soda.	Salts of Lime and Magnesia.	Silica.
Silica plants.	{ Oat straw, with seeds,	34.00	4.00	62.00
	{ Wheat straw,	22.50	7.20	61.50
	{ Barley straw, with seeds,	19.00	25.70	55.30
	{ Rye straw,	18.65	16.52	63.89
	{ Good hay,	6.00	34.00	60.00
Lime plants.	{ Tobacco,	24.34	67.44	8.30
	{ Pea straw,	27.82	63.74	7.81
	{ Potato plant,	4.20	59.40	36.40
	{ Meadow clover,	39.20	56.00	4.90
Potash plants.	{ Maize straw,	72.45	6.50	18.00
	{ Turnips,	81.60	18.40	...
	{ Beetroots,	88.00	12.00	...
	{ Potatoes,	85.81	14.19	...
	{ Jerusalem artichokes,	84.30	15.70	...

Until quite recently, the general opinion was entertained that by the continuous growing of one particular species of crop on the same piece of ground, and that even when the appropriate manures were supplied to it, both quantity and quality of the returns gradually diminished and deteriorated, until at length its cultivation proved fruitless. As accounting for this, the theory was advanced of plants excreting matter from their roots, and that any accumulation of this was hurtful to plants of the same species as the excreting one. But this opinion must now be surrendered; and where failures occurred in cultivation after such a sort, they were due, doubtless, to mistaken ideas as to the requisite manures, and the neglect of adopting means for the check of fungoid and insect ravages. Ample proof is now afforded by results in the case of grain crops, that the same species of crop may be continuously raised on the same plot of ground with profit, provided suitable manures are applied, freedom from weeds secured, and the ravages of insects and fungi averted. But hitherto this admission has had but little effect in altering the customary and fixed rotations of cropping peculiar to different districts and estates. No doubt, so long as the great majority of soils are subjected to the present mixed method of husbandry, which must of necessity accompany the rearing and feeding of live-stock, rotation of cropping must continue as an institution, providing as it does for the requisite proportions of litter and dry and green food for the various species of animals. Its different systems are determined by the nature of climate and soil, the situation and demand of the more convenient markets, and the

like considerations. But previously to observing in detail some of the ordinary rotations, it will here be expedient to notice succinctly the leading characteristics of our principal cultivated plants, the soils to which they are naturally best adapted, and the elements which they demand in greatest quantity from the soil.

Wheat is the most important of our cereal crops, as it possesses the proximate constituents in the proportion best suited for man's nutrition in temperate climates; it is therefore the staple bread-corn of the northern temperate zone. Its range of cultivation is wide, extending between the tropics and the isothermal line denoting the descent of the mean annual temperature to 56°. Also, it is cultivated in a great variety of soils; clayey loams suit it best; and its returns are more profitable from the stronger than a light class of soils. The average composition of the grain is indicated by the figures following:—

Water,	15.00
Nitrogenous compounds,	12.00
Oleaginous and respiratory do.,	68.50
Woody fibre,	2.75
Ash,	1.75

And the average of several analyses of the ash or mineral matter gives the following results:—

	Grain.	Straw.	Chaff.
Potash,	27.72	12.44	9.14
Soda,	8.05	.16	1.79
Lime,	2.81	6.7	1.88
Magnesia,	10.03	3.82	1.27
Iron, . . . . .	.67	1.3	.37
Phosphoric acid,	49.81	3.07	4.31
Sulphuric acid, . . . . .	.24	5.82	...
Silica,	1.17	65.38	81.22
Chloride of sodium, . . . . .	...	1.09	...

Barley has even a wider range of cultivation than wheat, maturing in almost every climate in the world. Unlike the wheat plant, whose roots penetrate deeply in the soil and sub-soil, those of barley ramify in the looser material nearer the surface, sending few down into the subsoil, but developing increased numbers of fibrils and hairs, so that its absorbent powers are very great.

It matures much quicker than the other grain plants; a period of from seven to eight weeks between seed time and harvest often suffices. It is best suited with light free soils. The analysis of the grain is as follows:—

Water,	16.0
Nitrogenous compounds,	19.5
Oleaginous and respiratory compounds,	67.0
Woody fibre,	3.5
Ash,	3.0

100.0

Of the ash :—

	Of its grain.	Of its straw.
Potash,	15·61	9·2
Soda,	5·03	·3
Lime,	3·06	8·5
Magnesia,	8·04	5·0
Oxide of iron,	1·24	1·0
Phosphoric acid,	35·68	3·1
Sulphuric acid,	1·22	1·0
Silica,	28·97	67·6
Chloride of sodium,	·45	·6

Oats are also cultivated throughout a wide range, but they are better suited for countries possessing a lower annual temperature, less sunshine, and a moister climate than those in which the cultivation of wheat and barley is extensively followed. In Scotland, the breadth under oats considerably exceeds that under wheat or barley. Like wheat, the oat sends its root deep into the soil and subsoil. It is cultivated in all, but more successfully on the stronger class of soils. The analysis of this grain gives :—

Water,	14·0
Albuminous compounds,	11·5
Oleaginous and respiratory compounds,	64·5
Woody fibre,	7·0
Ash,	3·0

That of the ash :—

	Of its grain.	Of its straw.
Potash, }	31·56	28·02
Soda, }		
Lime,	5·32	6·77
Magnesia,	8·69	2·61
Oxide of iron,	0·88	·77
Phosphoric acid,	49·19	...
Sulphuric acid, . . . . .	...	16·02
Silica,	1·87	35·37
Chloride of sodium,	·35	7·14

The *Bean* plant is grown with most profit on strong soils; but it is not cultivated to anything approaching the same extent as the cereals last mentioned, as it enters but little into the composition of our bread stuffs. It is chiefly used for stock-feeding purposes, and from the large proportion of albuminous compounds which it contains, it is especially valuable in the maintenance of muscle in hard working animals. This also applies to the other cultivated leguminous plants—peas, tares, and clover. The following is the analysis of beans :—

Water,	14·8
Albuminous compounds,	23·3
Respiratory and oleaginous compounds,	48·5
Woody fibre,	10·0
Ash,	3·4

And of the ash:—

	Of seed.	Of straw.
Potash,	42·13	21·26
Soda,	·90	4·56
Lime,	8·65	21·29
Magnesia,	6·55	4·88
Oxide of iron,	·36	·90
Phosphoric acid,	31·87	7·35
Sulphuric acid,	4·50	3·21
Silica,	·8	3·86
Chloride of sodium,	1·90	4·56
„ „ potassium,	·34	·90

The *Turnip* is a plant essentially suited to deep, loamy, light, and free soils, for these easily admit of thorough pulverisation, a condition of soil necessary for the development of the bulb, and the descent of its tap root, with its numerous diverging fibrils. As can easily be understood, from the numerous cultivated varieties, and the variety of soils in which turnips are sown, great diversity appears on analysis, but the following may be taken as averages:—

	White globe.	Norfolk Bell.	Swede.
Water,	90·430	92·280	89·460
Albuminous compounds,	1·143	1·737	1·443
Oleaginous and respiratory do.,	4·697	2·137	4·637
Woody fibre,	3·102	2·825	3·837
Ash,	·628	1·021	·623

The analysis of the ash gives:—

	In bulb.	In top.	In whole pi.
Potash,	34·1	15·21	28·65
Soda,	7·96	2·84	5·41
Lime,	9·93	28·49	23·27
Magnesia,	2·61	2·81	3·09
Oxide of iron,	·46	1·68	·86
Phosphoric acid,	9·85	6·17	9·29
Sulphuric acid,	13·12	8·43	12·52
Silica,	1·81	3·99	·86
Carbonic acid,*	11·96	9·98	...
Chloride of sodium,	8·13	15·3	16·05
„ „ potassium, . . . . .	...	5·04	...

The *Mangold-wurzel*, unlike the turnip, succeeds well in the strongest clay soils, though it is best suited for the medium class of these. On the European continent it is extensively cultivated for the manufacture from its saccharine compounds of the common sugar of commerce. It is largely substituted for turnips in the English midlands and eastern and southern counties, and in Ireland also. The organic analysis of the mangold is very similar to that of the turnip, but showing a larger percentage of non-

* Formed by the oxidation of the carbon.

nitrogenous bodies; its inorganic analysis is similar as well, excepting that it shows nearly double the amount of chloride of sodium.

Potatoes are cultivated on almost every kind of soil, though they thrive best on soils of the lighter class. They form a most important item of human dietary, and are also much used in the feeding of farm stock. The figures following represent their average analysis:—

Water,	75·00
Albuminous compounds,	2·00
Oleaginous and respiratory compounds (starch 15·)	17·00
Woody fibre,	5·00
Ash,	1·00

While its inorganic analysis appears as:—

	In tuber.	In "shaw" or "haulm."
Potash,	55·75	28·02
Soda,	1·86	16·26
Lime,	2·07	16·90
Magnesia,	5·28	7·09
Oxide of Iron,	·52	1·05
Phosphoric acid,	12·57	7·62
Sulphuric acid,	13·65	6·88
Silica,	4·23	3·85
Chlorine,	4·27	12·33

Clovers and artificial or cultivated *grasses*, as distinguished from those growing naturally in pastures, are grown on all soils subject to rotation, excepting, perhaps, the strongest clays. The organic analysis of some of them is—

	Red clover.	White clover.	Crimson clover.	Yellow clover.	Alsike clover.
Water,	80·65	83·65	82·56	77·38	76·67
Nitrogenous compounds,	3·60	4·52	3·25	3·44	4·82
Oleaginous and respiratory compounds,	13·85	10·26	12·31	17·16	16·45
Ash,	1·90	1·57	1·88	2·02	2·06

The analysis of the ash of the whole plant gives—

	Red.	White.	Yellow.
Potash,	23·49	14·33	23·26
Soda, . . . . .	...	3·72	...
Lime,	34·28	26·41	18·61
Magnesia,	12·60	8·15	8·34
Peroxide of iron,	1·20	1·96	·86
Phosphoric acid,	8·49	11·53	7·15
Sulphuric acid,	3·65	7·21	4·42
Chloride of sodium,	2·77	4·94	5·98
Chloride of potassium,	12·09	12·0	11·98
Silica,	1·43	3·68	1·01
Carbonic acid, . . . . .	...	7·0	15·51

Of common perennial and Italian *Ryegrass* the analyses are—

	<i>Lolium perenne.</i>	<i>Lolium Italicum.</i>
Water,	71.43	75.61
Nitrogenous compounds,	3.37	2.45
Oleaginous and respiratory,	12.99	14.91
Fibre,	10.06	4.82
Ash,	2.15	2.31

And of the ash of

	<i>Lolium perenne.</i>		
	In flower.	In seed.	As hay.
Potash,	12.45	10.77	8.03
Soda,	3.98	.13	2.17
Lime,	9.95	12.29	6.50
Magnesia,	2.23	2.64	4.01
Peroxide of iron, . . . . .	.78	.30	.36
Phosphoric acid,	6.04	6.32	12.51
Sulphuric acid,	2.82	1.31	...
Silica,	59.18	60.62	64.57
Chloride of sodium,	2.27	5.58	...

By conversion into hay, grasses and clovers lose about three-fourths of their weight of water.

Whatever may be considered the necessity of rotations as a preserver of the due balance of the soil's constituents, they at all events afford facilities for the periodical cleansing of the ground from the weeds, which at a subsequent period of any rotation might flourish in a particular crop, the nature of which might preclude any such purification; as in the case of grain crops, for instance, sown broadcast or too closely drilled to admit of the intervening soil being hoed. The crops in a rotation which allow of a thorough cleansing from weeds being effected are turnips and the like, mangolds, potatoes, and so on. As these several crops are drilled at a sufficient distance apart to permit the passage of horse hoes between the rows, the soil can be thoroughly kept free from weeds till the possibility of their flourishing is taken away by the growth of the crops to such a point as to effectually protect and shade the intermediate spaces from free air and light. The crops last-mentioned, together with grasses and other forage plants cultivated for the sake of their roots or leaves, pass by the name of green crops. The grain crops, on the other hand, or those cultivated for their seeds, are called white crops, corn crops, or cereals.

Formerly it was a prevalent custom at stated intervals to leave portions of ground uncropped for a whole season, repeated ploughing and other workings being granted to it during the summer, in order to destroy the weeds as far as possible. This was called giving the land a bare or naked fallow. This practice is still had on strong soils, but it is gradually yielding to that of taking out of the soil some green fallowing crops, *o.g.*, cabbage, which is well suited to strong soils. Wheat and beans in succession, with an occasional bare fallow is an example of a two

shift rotation on the strong clay soils. Wheat, beans, and fallow (either a bare fallow or a green crop) is an example of a three-shift rotation. A four-shift rotation practised in Norfolk is wheat, roots, barley, and clover. Of a five-shift, we have as an example, wheat, roots, barley or oats, and grass ("seeds") for two years. The Lothians' six-course is roots, wheat or barley, seeds one year, oats, beans or potatoes, and wheat; when the land is stiff, the wheat succeeds the roots, and beans the oats; barley and potatoes respectively being substituted where the ground is of a lighter nature. The following six-course shift is observed on some of the heavy alluvial soils of Scotland—fallow, wheat, barley, seeds, oats, and wheat. Of course there are numerous different courses of rotation, in addition to the above, according to the difference of peculiarity and requirement, in the various localities adopting them.

Measures.

Calculating upon the basis of the figures of the analyses, quoted in the preceding chapter, an average crop of wheat extracts, per acre, from the soil, inorganic compounds to the following amount:—

	lbs.		lbs.
Potash,	23	Phosphoric acid,	20
Soda,	1½	Sulphuric acid,	4
Lime,	8	Silica,	84
Magnesia,	6	Oxide of iron,	1

A fair crop of beans:—

	lbs.		lbs.
Potash,	66½	Sulphuric acid,	10½
Soda,	9	Silica,	7
Lime,	44¼	Oxide of iron,	1¾
Magnesia,	13	Chloride of sodium,	18
Phosphoric acid,	33	Chloride of potassium,	1¾

A crop of turnips weighing twenty tons to the acre approximately:—

	lbs.		lbs.
Potash,	145	Phosphoric acid,	50
Soda,	28	Sulphuric acid,	65
Lime,	116	Chlorine,	80
Magnesia,	16		

And a crop of potatoes weighing eight tons of tubers would extract approximately:—

	lbs.		lbs.
Potash,	90	Phosphoric acid,	20
Soda,	8	Sulphuric acid,	34
Lime,	5	Chlorine,	10
Magnesia,	8		

When clovers and grasses are depastured, only a trifling quantity of the inorganic constituents of the soil are removed from it, seeing that they are nearly all returned to the ground in the excreta of the grazing animals. But it is different when they are cut for hay; then the inorganic constituents are

carried away from the soil in quantity proportionate to the analysis of the plant. Cows remove more inorganic matter from the soil than fattening animals, from the fact of their milk containing a considerable amount of such materials, not again to be delivered to the soil. In like manner, young cattle, from their requiring frame-building constituents, remove more than does fattening stock.

Phosphoric acid, then, and potash, especially the former, are the most valuable of the soil's inorganic compounds, by reason of their being the scarcest among them, but at the same time requisite in considerable quantity for the health of cultivated plants. The quantity of the remaining constituents is sufficiently contained by most soils for ordinary requirements. Potash is scarcest in light soils; in the strong clay soils and sundry closely related to several of the igneous rocks, it is constantly present in the form of one of the silicates; phosphoric acid is also more abundant in the same class of soils. We saw, that of the organic elements, that one least available to plant life was nitrogen; for all which reasons it is, that ammonia or nitric acid, and phosphoric acid form the bases of all manufactured manures; which are called nitrogenous or phosphatic, according to the nature of the basis prevailing. Before it was commenced to manufacture mixtures of the necessary constituents, they were principally derived for return to the soil from the natural sources of farm-yard manure and town sweepings and refuse. The farm-yard manure was applied to so much of the ground as it could be spread over, the remaining arable or cultivated land was bare fallowed for a season; and, indeed, a bare fallow, in certain respects, resembles a manuring, for besides affording the opportunity of thoroughly cleansing the land from weeds, the frequent ploughings and dressings it undergoes expose its whole substance to the atmospheric action, which renders such important chemical changes, and breaks up insoluble compounds, fitting them for plant consumption in the next season.

When the situation afforded facilities for the purpose, town manure and other waste were turned to account. But a demand for other manures than these sprang up with the introduction of turnip cultivation and generally improved farming. Guano was imported, recourse was had to the use of bones; and at length the way was opened up to the production of artificial manures suitable for all kinds of crops. And now the market is full of manures compounded for the specific requirements of all our cultivated varieties, and all manner of waste and all refuse, in any respects qualified to return plant-food to the soil, are well economised, with the exception of town sewage, perhaps; for the many difficulties preventing its profitable application to the soil yet remain to be overcome. When we consider the fact of our country not producing of itself sufficient food for the popu-

lation, the importation of the extra quantity needed from abroad, and the immense amount of manure stuffs now applied, and when, in addition we bring to mind the truths of all chemical elements being indestructible, and all such as compose the food of man and the lower animals being voided, some as gases, indeed, but the vast proportion in the form of fluids and solids, it must be allowed, that if its soil were the recipient of all these which are now lost, the fertility of Great Britain would naturally increase at an indefinite ratio. But, on the contrary, we see a gigantic illustration of wastefulness—the excreta of the inhabitants, and the other valuable manurial substances of our great cities and towns, poured into rivers, which are converted by the process into gigantic open sewers fatal to life, rolling everything to the sea. Where a regular course of rotation is observed, the general rule is, to apply to the green crops all the farm-yard manure with others, in quantity sufficient for all the requirements of every subsequent crop of the rotation. But the practice of supplementing this application by another of specific manures for the successive crops, is now rapidly extending, under the influence of scientific farming.

Farm-yard manure, consisting as it does of the excreta of the various animals of the farm, and the straw of the cereals and other waste matter, contains all the elements requisite for plant life. The litter of fully grown animals, fed upon rich food, with a large proportion of nitrogenous and phosphatic substances, evidently affords a more valuable manure than does that of stock fed upon a poorer dietary, or that of young growing animals. Such manure, too, made under cover, or sheltered from exposure to rainfall, must also of necessity present a better quality than when it has been exposed to the open atmosphere and the washing action of rain. The following table from Stephens shows the proportions of the ingredients of one ton of farm-yard manure:—

Water,	1455·104 lbs.	Silica,	62·585 lbs.
Organic matter (con- taining 16·584 lbs. of ammonia),	553·504 „	Carbonic acid (with earths),	11·393 „
Potash,	7·481 „	Sulphuric acid, „	7·571 „
Soda,	6·317 „	Phosphoric acid, „	17·468 „
Lime,	21·427 „	Chlorine,	7·280 „
Magnesia,	4·337 „	Sand,	71·702 „
Alumina,	trace	Carbon,	1·926 „
Manganese,	trace	Alkali and loss,	7·282 „
Peroxide of iron,	4·623 „		
			2240·000 „

Guano is composed of the excreta of marine fowls and the remains of their bodies, and it is chiefly found accumulated in thick deposits on several islands off the Peruvian coast, which are never visited by rain. Their situation in a rainless zone has prevented the washing away of the valuable constituents of these strata, which are found consolidated into a dry unfermented mass. The following is the analysis of a first-class Peruvian guano:—

Water,	10.37
Organic matter and ammoniacal salts,	55.73
Phosphates,	25.20
Alkaline salts,	7.50
Sand,	1.20

Ammonia contained equal to 18.95.

This shows a most valuable manure, especially rich both in nitrogenous and phosphatic compounds. Phosphatic bodies predominate in many guanos, which are thence called phosphatic guanos. From the excessive demand, the supply of Peruvian guano is rapidly becoming exhausted. New sources have been made available, but their geographical position being less favourable, the sample of guano yielded is much inferior to the Peruvian.

Of the artificial manures, various are manufactured with a fixed percentage of nitrogenous and phosphatic compounds. These compounds, however, are for the most part respectively applied in separate compositions. As nitrogen food, the principal compounds bestowed upon the soil are the two salts, nitrate of soda and sulphate of ammonia. Besides these there are many available sources of nitrogen supply, including all waste organic substances. The phosphoric acid entering into the composition of artificial manures is entirely combined with lime, in the form of a salt called phosphate of lime, and its chief sources are animals' bones, coprolites, and apatite. Of these, coprolites are found as concretions in certain rock strata, and are supposed to be the fossilised faeces of gigantic animals, reptiles for the most part existing at the time of the formation of the strata in question. Apatite is a mineral phosphate of lime, and is found in large quantity in various parts of the world. The phosphate of lime as combined in these quarters consists of two molecules of phosphoric acid in chemical union with three atoms of calcium, $\text{Ca}_3\text{2PO}_4$ —an almost insoluble salt. To overcome the insolubility sulphuric acid is added, and it alters the nature of the phosphate, rendering it soluble, by taking from it two atoms of calcium—forming with them sulphate of lime or gypsum, and replacing the calcium atoms by their equivalent of hydrogen. Thus, $\text{Ca}_3\text{2PO}_4 + 2\text{H}_2\text{SO}_4 = 2\text{CaSO}_4 + \text{CaH}_4\text{2PO}_4$. This soluble salt is termed superphosphate of lime. When bones are treated in this way with sulphuric acid they are known as "dissolved bones;" and in addition to the phosphate and sulphate of lime, they also possess a considerable quantity of ammonia, resulting from the organic matter of the bone. When the gradual absorption of phosphoric acid is desired in the soil, crushed bones and bone "meal" are applied, without their having received any such dressing. The minute mechanical division of their particles permits of a prolonged action upon them by the chemical changes occurring in the soil, and an equally delayed complete

yielding up of their organic matter and phosphates; the length of such delay being proportioned to the size of the triturated particles. Bone ashes, *i.e.*, bones deprived of their organic substance, contain fewer impurities than the natural phosphates of lime, and yield the most valuable superphosphates. "A variety of substances," says Anderson, "are sold under the name of nitrophosphate, potato manure, cereal manure, &c., which are all superphosphates, differing only in the proportion of their ingredients, and in the addition of small quantities of alkaline salts, sulphate of magnesia, and other substances, but they present little difference from ordinary superphosphates in their effects." The following, according to the same authority, are analyses of various superphosphates:—

	Bones, alone.		Bone ash.		Chiefly Coprolites.		Mixtures contain- ing salts of ammonia.	
Water,	7.74	7.79	5.33	10.40	5.90	10.17	7.07	15.82
Organic matters and } ammoniacal salts, }	17.83	21.69	6.94	4.92	5.10	4.13	9.87	13.96
Biphosphate of lime, } Equivalent to soluble } phosphates, }	13.18	9.87	21.35	23.09	12.24	13.75	17.63	12.67
	(20.57)	(15.39)	(33.33)	(36.02)	(19.10)	(21.43)	(27.50)	(19.77)
Insoluble phosphates,	10.31	21.17	5.92	6.08	16.90	0.17	12.60	8.40
Sulphate of lime,	46.00	35.30	56.16	47.78	52.39	62.62	49.77	45.14
Alkaline salts,	1.46	0.94		trace	2.47	0.96	0.06	1.07
Sand,	3.48	3.00	4.23	4.30	6.00	8.20	3.00	2.94
Ammonia contained } equal to, }	2.11	3.01	0.23	0.31	0.11	0.57	1.28	1.55

The cheapest source of potash is the mineral called kainit, containing sulphate of potash, which has now begun to be extensively supplied to turnips, potatoes, mangolds, &c. Gypsum, or sulphate of lime, is also applied occasionally to leguminous crops.

Another method for increasing the soil's fertility employed by advanced farmers, is the feeding of sheep upon rich artificial substances, whereby, whilst the primary object of fattening the animals is speedily attained, the soil is benefited by receiving their valuable excreta, becoming enriched with manurial bodies.

Other bodies, besides, are supplied to the soil, in order to promote certain physical as well as chemical results. Thus, clay is added to light sandy and peaty soils, that thereby they may receive body or staple; and, reversely, sand and peat are added to clay soils, the former—in order to render them more friable, the latter to increase their stock of organic matter. In some districts the clay of strong soils is burnt, for the consequent effect of its friableness being increased, and many of its insoluble compounds being broken up. Lime, however, is the principal of all the substances which are added for combined physical and

chemical effects. Besides disintegrating the strong clay, it also breaks up the insoluble silicates and liberates the combined alkalis. Moreover, it promotes changes amongst the organic compounds, in peaty soils especially. Nor has it less importance as being a direct source of food to plants, for all of them contain more or less lime. By its application, the quality of grain is improved, and its maturity hastened; whilst again, in pasture ground, it serves to extirpate moss and plants of low organisation. All those effects of lime are more marked and more efficacious if it has been applied in the caustic state. Frequently, however, it is applied as the carbonate, in the form of chalk, marl, and shell sand; for these are often to be had cheaply and conveniently, where lime "shells" are difficult to obtain.

In connection with the above general laws, there are numerous considerations to be attended to, in regard to the application of manures, which are too complicated, and too closely associated with actual practice, to be touched upon here. They bear principally upon the proper times, quantities, and mutual proportions which are essential to their profitable use.

Rearing and Management of Stock.—Although, in our home market, the foreign agriculturists can favourably compete with us in grain production, it is otherwise with regard to the production of beef and mutton. It is true, indeed, that, in spite of the obstacles ensured to them in a ruder system of agricultural practice, and a greater dependence of necessity on mere natural agencies for the maturing of their stock, they still can rear cheaper meat. But before our markets are reached, there are the risks, difficulties, and expenses of transit to be encountered. Doubtless, the appliances of science will tend to the gradual diminution of these difficulties, as witness the importation of cooked beef and mutton of fair quality from Australia, and the sale in some of our markets at paying figures of fresh beef from America. But before the American and European countries exporting to us can produce live stock so speedily attaining a high quality as ours do, and affording such a high-class description of meat as our markets demand, there must prevail amongst them a higher practice of agriculture, involving the introduction of improved breeds of animals. And there is no reason why British farmers should not maintain their pre-eminence in this respect. Almost the entire number they export reach us in a lean condition, and require to be fattened here, under our more advanced system. For since, within recent times, beef and mutton have become a more important branch of our agricultural produce than grain, scientific attention has been turned to the investigation of animal dietary, with the result of many natural bodies formerly overlooked, together with new artificially prepared compounds, having come into general use in the feeding of the live stock of the farm. Physiology has taught us which

of the proximate feeding compounds should be the principal ingredient in the food of each class of animals. Substances, accordingly, rich in albuminous matter, should constitute the food of hard-working animals, that fibrin and albumin may be applied to their muscular wants. To such as it is desired that they should be quickly fattened, and which undergo only sufficient exercise to maintain good health, are freely given compounds known to contain much fat-forming material. To young growing animals a fair proportion of both kinds of food is offered, and such substances in addition as hold saline bodies, like phosphate of lime, which avail for the building up of the bones. Milk affords a safe criterion of the food constituents appropriate to young animals. It is the food nature provides for them, and none other can be so perfect. According to Way, the average composition of cow's milk is—

Water,	87.02	Sugar of milk.	4.67
Butter,	3.23	Ash,	0.60
Casein,	4.48		

And of its ash (from two analyses by Haidlen, of 1000 lb. of milk, each of separate cows)—

	lbs.	lbs.
Phosphate of lime,	2.31	3.44
“ magnesia,	0.42	0.64
“ peroxide of iron.	0.07	0.07
Chloride of potassium,	1.44	1.83
“ sodium,	0.24	0.34
Free soda,	0.42	0.45

The oleaginous bodies contained in the fluid are broken up into minute globules or cells; and when new milk is allowed to settle in any suitable vessel, these rise to the surface, and form the cream. When the cream is removed, it leaves the skimmed milk almost entirely devoid of oily matter. The albuminous matter, or casein, is held in solution by the fluid, by means of some one of the alkaline bodies; the latter becomes neutralised by the addition of certain acids, whereupon the casein coagulates, and this curd, by pressure and suitable treatment, becomes converted into cheese. The remaining fluid, or whey, contains the sugar and the inorganic salts. The natural curdling of milk takes place when lactic acid, $C_3H_6O_3$, its peculiar acid, is formed; and its presence is evidenced by the fluid becoming sour in taste. Johnson says:—“The change which takes place when milk becomes sour is easily understood. Under the influence of the casein, the elements of a portion of the milk-sugar are made to assume a new arrangement, and the sour lactic acid is the results. There is no loss of matter; no new elements are called into play; nothing is absorbed from the air, or given off into it; but a simple transposition of the elements of the sugar takes place, and the new-acid compound is produced. These

changes appear very simple, and yet, how difficult is it to conceive by what mysterious influence the mere contact of this decaying membrane, or of the casein of the milk, can cause the elements of the sugar to break up their old connection, and to arrange themselves anew in another *prescribed* order, so as to form a compound endowed with properties so very different as those of lactic acid."

Lactic acid is also produced during the churning of cream, and is supposed to aid the violent mechanical agitation, in breaking the walls of the oily cells or globules, after which the butter separates in mass from the sour butter milk. In the ordinary domestic manufacture of cheese, "rennet," an acid decoction prepared from the dried stomach of a calf, is what is ordinarily added to the milk, for the purpose of coagulating or curdling the casein.

As cow milk is such an invaluable article of the human dietary, calves are often early deprived of this, their natural food, or, at all events, only partake of it after its cream has been abstracted. But suitable artificial food is substituted, rich in the various proximate constituents. But even in those cases where a fair amount of milk is afforded to them, it is sometimes usual to mix with it linseed, or some similar meal, whenever the calf can eat artificial stuffs, and nutritious green food is provided as well. Lambs and young pigs are not prematurely deprived of mother's milk; but she is fed with food calculated to enrich the qualities of her milk.

Before the introduction of turnips, owing to the want of green or juicy food for the live stock during winter, the animals had attained, as a rule, their full growth and maturity, ere they were fattened enough for slaughtering. Throughout summer and the milder months they had the range of the pasturage; and in winter they were turned into the fold-yards, more indeed for the purpose of trampling down and converting the litter into manure, than of being carefully tended, and provided with nourishing food, their dietary being almost entirely composed of hay and straw. Sheep also had to subsist entirely upon the natural pasturage; few, if any, were kept on the arable farms. The state of matters is now entirely different. A variety of green crops is cultivated; there is the choice of an immense assortment of artificial feeding stuffs, and every breed of stock has been improved to the development of the most extraordinary qualities of speedy and economical fattening. Consequently, stock is kept in every district in amazingly increased numbers, and sent to the meat market in prime condition, at a comparatively early age. Even in such counties, where, from physical and climatic obstacles, a large proportion of the land necessarily remains in its natural condition, the cultivation of the residue is wholly directed towards stock-breeding and rearing,

the produce of the large number of breeding animals kept being sold off as "store" cattle and sheep for fattening in more favoured districts. In point of fact, since the increased demand for prime "butcher meat," down through all ranks of the community, has so particularly raised the price of the article, the great end of all British agriculture is becoming more and more exclusively the rearing and feeding of live stock.

The peculiarities of the digestive economy in ruminants, rendering juicy and bulky food, like our different grasses, most appropriate to their use, they cannot be reared and fattened on dry concentrated food alone, without incurring the risk of disease. During winter and the non-vegetative months our various green and root crops form admirable substitutes for grasses. Concentrated feeding stuffs added to the natural bulky food, whilst they do not impair the digestive functions, supply the absorbents with materials rich in the several proximate compounds for maintaining and multiplying the animal tissues. As we have seen by the foregoing analysis, grasses and clovers are much more nutritious than equal weights of turnips; wherefore, stock which is being fattened on grass does not, as a rule, receive concentrated feeding stuff in addition, though under the high pressure system, the contrary practice is beginning to obtain. Animals being winter fed, however, receive, as a matter of course, artificial food in addition to the straw and turnips; and their quickly increasing weight is the justification. Stuff, rich in albuminous proximate compounds, are the most valuable, by reason of their affording the necessary flesh-forming material, and at the same time increasing the manurial value of the excreta; and their value reaches a maximum by the daily proportionate admixture of oleaginous and respiratory bodies. Of grains most used are ground barley, beans, and Indian corn; wheat and oats are not often given to pasturing stock, though the last is often put before store cattle. Bran, malt dust, and the refuse malt and liquids of breweries and distilleries, are also made use of. Of the many waste substances of the manufactory, which chemical knowledge has made available for stock feeding, the most important are the solid cakes or tablets, the residuum of the oil-extracting process by pressure from linseed, rape seed, cotton seed, &c. As these contain some of the oil, and all the other proximate constituents in the composition of the seed, they constitute a most invaluable concentrated feeding stuff. It ought not to be lost sight of, that however high their value, as containing such constituents may be, it must needs be regulated by their properties of easy digestion, otherwise such constituents will pass through the alimentary canal but little acted upon. Digestibility accordingly, especially in the case of fibrous substances, is greatly promoted by subjecting feeding stuffs to steaming, or such like concoction, or to fermentation.

The following table from Anderson, gives the nutritive composition of numerous feeding materials:—

N.B.—Where a blank occurs in the oil column, the quantity of that substance is so small as to be unimportant. When the respiratory elements and fibre have not been separated, the sum of the two is given.

	Nitro- genous Com- pounds.	Oil.	Respira- tory Com- pounds.	Fibre.	Ash.	Water.
Decorticated Earth Nut Cake,	44.00	8.86	19.34	5.13	14.05	8.62
" Cotton Cake, . . .	41.25	16.05	16.45	8.92	8.05	9.28
Poppy Cake,	34.03	11.04	23.25	11.33	13.79	6.56
Teel, or Sesamum Cake, . . .	31.93	12.86	21.92	9.06	13.85	10.38
Rape Cake,	29.75	8.63	35.72	7.30	8.65	6.95
Dotter Cake,	29.00	7.99	27.04	16.12	12.59	7.26
Tares (home grown),	28.57	1.30	58.64		2.50	8.99
Linseed Cake,	28.53	12.47	35.78	6.32	6.11	10.79
Rübsen Cake,	26.87	11.00	31.47	16.95	8.00	5.71
Tares (foreign),	26.73	1.59	53.04		2.84	15.80
Earth Nut Cake (entire seeds),	26.71	12.75	45.69		3.29	11.56
Niger Cake,	25.74	6.58	42.18	11.15	8.12	6.23
Beans (65 lbs. per bushel), . .	24.70	1.59	54.51		3.36	15.84
Lentils,	24.57	1.51	58.82		2.79	12.31
Linseed,	24.44	34.00	30.73		3.33	7.50
Grey Peas,	24.25	3.30	57.99		2.52	11.94
Foreign Beans,	23.49	1.51	59.67		3.14	12.21
Cotton Cake (with husk), . . .	22.94	6.07	36.52	16.99	6.02	11.46
Pea-nut Cake,	22.25	7.62	30.25	26.97	3.71	9.20
Sunflower Cake,	21.68	8.94	19.05	33.00	9.33	8.00
Hempseed Cake,	21.47	7.90	22.48	25.16	15.79	7.21
Kidney Beans,	20.06	1.22	62.16		3.56	13.00
Maple Peas,	19.43	1.72	63.18		2.04	13.63
Mulia sativa (seed),	18.41	36.55	34.59		4.13	6.32
Clover Hay (mean of differ- ent species of clover,)	15.81	3.18	34.42	22.47	7.59	16.53
Rye,	14.20	...	81.51	2.47	1.82	14.06
Bran,	13.80	5.56	61.67		6.11	12.85
Oats,	11.85	5.89	57.45	9.00	2.72	13.09
Fine Barley Dust,	11.49	2.92	71.41		2.67	11.51
Wheat,	11.48	...	73.52	0.68	0.82	13.50
Bere,	10.25	...	62.85	10.08	2.60	14.22
Hay (mean of different grasses),	9.40	2.56	38.54	29.14	5.84	14.30
Barley,	8.60	...	64.52	9.67	2.82	14.30
Coarse Barley Dust,	8.46	3.47	69.73		7.31	11.63
Rice Dust,	8.08	2.95	69.22		8.12	11.63
Oat Dust,	6.92	3.21	72.86		7.70	9.31
Winter Bean Straw,	5.71	...	67.50		6.39	20.40
Carob Bean,	3.11	0.41	62.51	18.60	2.80	12.57
Potato,	2.81	...	17.30	1.07	1.13	77.69
Carrot,	1.87	...	7.91	3.07	1.11	86.04
Wheat Straw,	1.79	...	31.06	45.45	7.47	11.23
Barley Straw,	1.68	...	39.98	39.80	4.24	14.30
Oat Straw,	1.63	...	37.86	43.60	4.95	12.06
Mangold-Wurzel,	1.54	...	8.60	1.12	0.96	87.78
Cabbage,	1.31	...	4.53		1.05	93.11
Turnips,	1.27	0.20	4.07	1.98	1.71	91.47

It is obvious that a barely sufficient supply of food for the daily wear and tear of an animal's existence will not contribute to any increase of the animal's weight. To produce this last effect an excess of nutriment over what is requisite for daily wants, and even above the limits of the power of absorption and assimilation, must be afforded. Albuminous bodies, as we have seen, replace and increase muscular tissue, whilst the oleaginous bodies do the same for the fatty tissues. As the latter multiply, they become deposited in all parts of the otherwise dense muscular tissues of the body, increasing their bulk and juiciness, and rendering them more tender and palatable and easy of digestion as human food. The saccharine and amylaceous bodies are primarily appropriated for the respiratory processes; but their excess, present in the blood, is also capable of conversion into fat-forming material, though in a less degree than the oleaginous constituents. For whilst 1 lb. weight of the latter can supply 1 lb. of fat to the animal body, it takes $2\frac{1}{2}$ lbs. of respiratory compounds to produce an equivalent result. To many it is probably an unsuspected fact, that even in lean animals, the fat contained in the whole body exceeds the quantity of albuminous substance. The following table, also derived from the last-named authority, and based upon calculations resting upon the elaborate experiments of Messrs Gilbert and Lawes, shows approximately the general composition of the entire carcass of a lean and a fat animal respectively:—

	Lean.	Fat.
Mineral matters,	5	3
Nitrogenous compounds,	15	12.5
Fat,	24	33
Water,	56	48.5

And the following, from the like authority, gives the percentage composition of the increase in fattening oxen, sheep, and pigs:—

	Mineral matter.	Nitrogenous compounds.	Fat.	Water.
Oxen,	1.47	7.69	66.2	24.6
Sheep,	2.34	7.13	70.4	20.1
Pigs,	0.06	6.44	71.5	22.0

Whence it appears that for every 1 lb. of albuminous matter assimilated by the system, there are likewise assimilated, in round numbers, 10 lbs. of fat and 3 lbs. of water. Theoretically, it might be assumed that a similar proportion should prevail in the food material given to fattening animals. But this is not sustained in practice. For the substances demonstrated by experience as being the most efficient for fattening our stock—for example, the various oil-cakes, grasses, leguminous plants, turnips, &c., all contain these proximate constituents in a much

more equal proportion than that of 1 to 10. Any apparent anomalously disappears when we call to mind that with the progress of—from a physical point of view—degeneration in the animal body, owing to the want of a natural amount of muscular exertion the albuminous bodies becomes less and less requisite to the tissues, and their absorption into the blood slower. This may either be owing to the already highly nourished and consequently denser condition of the blood retarding their absorption by the process of endosmoses, or to some obscure natural provision. At all events, the balance of the blood constituents is preserved and disease averted by reason thereof. The increased difficulty of their absorption, however, necessitates a larger quantity of the albuminous bodies being present in the food, in order that the absorbents may be enabled to the utmost to take up a sufficient modicum. All the while the fattening substances, from the ease with which they are assimilated, have their excess laid up in all parts of the system. The following table, still from the same authority, shows the amount of each class of constituents stored in the increase, for every 100 consumed in the food, by—

	Mineral matters.	Nitrogenous compounds.	Fat.	Total dry substance.
Sheep, . . .	3.27	4.41	9.4	8.06
Pigs, . . .	0.58	7.34	21.2	17.3

The last shows the greater power of assimilation of food possessed by the pig over the sheep, and its consequent property of cheaper and speedier fattening. A main object in breed improvement is the development of such a quality in stock.

Farm horses, those admirable serfs of the husbandman, are appropriately fed with dry concentrated food, rich in albuminous substances. Experience has selected oats and hay from this class, with the addition of beans in the spring and early summer months, when calls for draught power are scarce. In summer the animals enjoy a short respite, when grass is given, as being better suited to diminished muscular expenditure, and economical at the same time.

As regards the actual details of ordinary agricultural practice and routine, these, indeed, can best be learned by experience in the field. In every county, nay, almost in every parish, they vary appreciably. But the scientific principles of agriculture are equally applicable in every country and clime, and the student may investigate them to their utmost extent in the works of Stephen's; Wilson's *Farm Crops*; Liebig's, Anderson's, and Johnston's writings on Chemistry applied to Agriculture; Roseoe on Chemistry; Geikie on Geology; and Balfour and Brown on Botany, with many other volumes too numerous to mention.

ON THE TREE MALLOW (*LAVATERA ARBOREA*) AS AN AGRICULTURAL PLANT FOR CATTLE-FEEDING, PAPER-MAKING, AND OTHER PURPOSES.

By WILLIAM GORRIE, Rait Lodge, Trinity, Edinburgh.

[Premium—Ten Sovereigns.]

HAVING, on the 4th May 1870, exhibited a specimen of the highly promising, but hitherto neglected, bunch grass of British Columbia in the Edinburgh Corn Exchange, the young spring growths of which measured at that early period from 3 to 3½ feet in height, I was invited to show it the same day at a conference—between the Directors of the Scottish Chamber of Agriculture and a number of paper-makers from the surrounding districts—“on the practicability of growing a useful material at home for the supply of the paper manufacturers, as a substitute for esparto grass.” In reply to inquiries that were there made, I stated that if the straw of ordinary corn crops, and that of our stronger growing native grasses, such as the common reed (*Phragmites communis*), the reed canary-grass (*Phalaris arundinacea*), and others, possessed sufficient tenacity for paper-making, I believed that the bunch grass (*Elymus condensatus*) would prove equally suitable; and that a greater weight per acre of material could be got from it than from any of the forementioned. In this opinion I am now more fully confirmed, from my original plant, which was reared from seed in 1866, having since annually yielded very dense close crops of both barren or leafy, and fertile or seed-bearing stalks, which in each of the past six years measured from 9 to 9¾ feet in height. Having thus been led to look out for “paper-fibre plants,” I have now several highly promising exotic kinds under trial, besides that indigenous one which forms the subject of the following communication.

In July 1870 I spent some days near Kildonan, in the south of Arran, when I was much struck with the gigantic size and showy appearance of the many fine tree mallows which were there grown for cottage-garden ornamentation, and had become naturalized in some waste places. Two of the former were found to measure fully 12 feet in height, while few were under 9 feet. In a long, hedge-like belt of the latter I came upon a continuous mass of fibre, stretched among a thick growth of grassy herbage, which turned out to be the only remains of a large mallow plant that had fallen or been broken down the previous season, and all else of which had rotted away. This fibre I took with me, along with a sample of fresh bark; and having subsequently secured specimens of the matured plants, as well as a supply of the ripe seeds, I handed a portion of each to David Curror, Esquire, secretary to the Chamber of Agriculture, who had the bark tested

for its fibre properties by Messrs A. Cowan & Sons, of the Valleyfield Paper Mills, Penicuik; and the seeds analysed by Dr Stevenson Macadam. In a note which Mr Curror sent me, dated 21st November 1871, he stated, "the results are that the stalks are worth L.5 per ton for paper-making; and the seeds as valuable for feeding as linseed cakes."

Messrs William Blackwood & Sons, of Edinburgh and London, having kindly transmitted a plant, and sample of the green tree mallow bark to Messrs J. Dickinson & Co., of the Nash Paper Mills, Hemel-Hempstead, for their opinion as to its properties, they stated, in a letter, dated January 1873, "that the bark of the plant contains a large proportion of fibre well adapted for paper-making purposes, and possibly also for the manufacture of common cordage." They estimated the market value of the bark at about L.8 per ton, and, by way of encouraging an experiment, offered to take two or more tons at that price. They also kindly inclosed a specimen of "half stuff" prepared from the bark, and "showing the fibre to be of fair strength even when highly bleached." Messrs William Tod & Sons, of the St Leonard's Paper Mills, Lasswade, having made some experiments on a limited scale with the dried bark, were so well pleased with the results that they offered, "at least, L.10 per ton for it," that being the price they were then paying for esparto grass, or about the same as the forementioned, L.5 per ton offered by Messrs Cowan for the stalks, the bark and woody matter in these being each nearly equal in weight. Mr Henry Bruce, of Kinleith Paper Mills, Currie, having expressed a desire to experiment on a largish scale with the mallow bark, his manager applied for from 1 to 5 cwts. of it—which quantity I was unable to supply. This application, and the preceding offers, induced me to undertake the aftermentioned culture of the tree mallow in the Island of Bute, in which I was obligingly assisted by Charles Duncan, Esquire of Woodend, Rothesay.

On the 7th of last August I addressed a letter to Fletcher Norton Menzies, Esquire, secretary to the Highland and Agricultural Society of Scotland, of which the following is an extract:—

Agricultural Plant for Cattle-Feeding and Paper-Making.—A selected variety of the tree mallow (*Lavatera arborea*), the natural habitats for the normal form of which in Scotland are the Bass Rock, with other islets in the Firth of Forth, and Ailsa Craig. Its ordinary heights vary from 6 to 10 feet, but it can be grown to more than 12 feet. It is a biennial, but the first year it may be planted, after the removal of any early crops, and matured in that following. From the limited experiments which I have been enabled to make, its products in seed, bark, and heart-wood are estimated at about 4 tons of each per acre. Chemical analysis by Dr Stevenson Macadam, and by Mr

Falconer King of its seeds, show these to be about equal in feeding properties to oil-cake, the present value of which is about L.10 per ton, and paper-makers offer the same price, at least, for the bark that they now pay for esparto grass, which is also about L.10 per ton, thus showing a return of about L.80 per acre for the seed and bark; and it is expected that the excess of fibre in the latter will allow of the heart-wood being mixed up with it, which will add very considerably to the above-stated value of crop. The paper-makers who have had the tree mallow bark under limited trial for me are Messrs Dickinson, Nash Mills, Hemel Hempstead; Mr Henry Bruce, Kinleith Mills, Currie; Messrs A. Cowan & Sons, Valleyfield Mills, Penicuik; Messrs William Tod & Sons, St Leonard's Mills, Lasswade; and Messrs William Tod, jun., & Co., Springfield Mills, Lasswade—all of whom think very highly of it, and are most anxious to try it on a large scale. With the view of having this done, I had plants reared in the Island of Bute in 1875, and about two acres planted with them after the removal of a crop of early potatoes. These plants throve well till a fall of snow took place early in the winter, when the whole were destroyed by rabbits. Bute was chosen for this trial in consequence of the winters on the east coast being sometimes too cold for the mallow plants, many of which suffer when the thermometer falls to about 15° Fahr., and most of them are entirely killed when it falls much below 10°; which excesses of cold, although occasional on the east coast, are never experienced on the western coasts nor in the Orkney Islands, in various parts throughout which, where the mallow has been tried, it has invariably been found to thrive well; and I feel confident that it might there be made to yield higher pecuniary returns, from hitherto comparatively worthless ground, than ordinary agricultural crops do in the best cultivated districts of Britain. Having already been at considerable trouble and expense in thus experimenting with the tree mallow, and not caring to incur further outlay, I have handed over my stock of seeds to Messrs P. S. Robertson & Co., of the Trinity Nurseries here, who have now plants ready for supplying any who may be desirous of carrying out its cultivation, charging only 2s. 6d. per 100 to cover expenses."

The preceding communication was read at the first meeting for the season of the Directors of the Highland and Agricultural Society, and on the 2d November I was favoured with the following:—

"Dear Sir,—At the Directors' meeting held yesterday I was instructed to thank you for your communication on the tree mallow. I sent your letter to the newspapers to give the matter all the publicity we could.—Yours faithfully, F. N. MENZIES."

In course of the past autumn I sent circulars of like purport

with the preceding to a considerable number of landed proprietors and others, chiefly connected with the western and northern coasts of Scotland, many of whom have now fairly embarked in the experimental culture of the tree mallow.—See list appended.

The following are the analytical results above referred to:—

“Analysis of sample of ‘Tree Mallow Seed,’ received from D. Curror, Esquire, secretary of the Chamber of Agriculture, Edinburgh. Grown at Kildonan, Island of Arran.

Moisture,	15.56
Oil,	11.78
Albuminous compounds,	18.45
Starch, gum, and sugar,	43.83
Woody fibre,	4.96
Ash,	5.42
	100.00
Nitrogen,	2.96
Phosphoric acid in ash equal to ordinary bone phosphates,	1.68

“The tree mallow seeds possess the nutritive constituents of a good feeding stuff, and well deserve a trial by the feeders of stock. It is not so rich in albuminous or flesh-producing ingredients as linseed, or other well-known cakes, but considering the loss of nutrient value in the manure when the richer cakes are given to cattle, it is possible that the tree mallow seed would not be much behind ordinary cake in feeding qualities.

“STEVENSON MACADAM, Ph.D., F.R.S.E.,
“*Lecturer on Chemistry.*”

“ANALYTICAL LABORATORY,
“SURGEONS’ HALL, EDINBURGH, 8th November 1871.”

“LABORATORY OF CITY ANALYST.
“EDINBURGH, 19th December 1874.

“Analysis of Tree Mallow Seed, received from, and grown by, Mr W. Gorrie, at Rait Lodge, Trinity.

*Albuminous compounds,	17.00
Oil,	13.22
Starch, sugar, &c.,	27.91
Woody fibre,	20.59
†Ash,	7.20
Moisture,	14.08
	100.00
*Containing nitrogen,	2.72
†Containing sand,	0.56

“From the foregoing results it is evident that this seed will form a valuable feeding stuff. It contains quite as much oil as the generality of linseed cakes: and although the amount of albuminous substance is lower than in ordinary good linseed cake, it is not far out of proportion to the heat-giving ingredients.

“J. FALCONER KING.

“LABORATORY OF CITY ANALYST,
“EDINBURGH, 6th February 1875.

“Analysis of green and dried Bark of Tree Mallow, received
from Mr William Gorrie, Rait Lodge, Trinity.

	Green Bark.	Dried at 212° F.
Moisture,	75.20	...
Mucilage,	1.90	7.68
Fibre,	8.28	33.38
* Ash,	3.46	13.95
Nitrogenous matter, oil, starch, &c.,	11.16	44.99
	<hr/>	<hr/>
	100.00	100.00
* Containing sand,	0.64	2.58
„ alkaline salt,	1.50	6.04

“J. FALCONER KING.”

The following results have been reported by parties to whom I previously gave seeds for trial:—

Mr Archibald Gorrie, then wood manager for the Earl of Leicester, Holkham Hall, Norfolk, wrote on the 17th August and 3d September 1874:—“A plant of the tree mallow No. 1, grown by itself, yielded 10 lbs. of green bark, which was reduced to 4 lbs. by drying, and its dried seeds weighed 2 lbs. 13 oz. Plants 2, 3, and 4, grown in a row about 2 feet apart, yielded 16 lbs. of green bark, which when dried was reduced to 8 lbs., and their dried seeds weighed 7 lbs.”

Mr Robert Henderson, manager for Colonel F. Burroughs, Island of Rousay, Orkney, writing on the 30th of October last, stated that—“The plants reared from your tree mallow seeds, which were sown here in May 1875, have all flowered except three, and we only want a little dry weather to ripen and secure the seeds well. The average height of the plants is from 6 to 7 feet, and I send you by steamer a sample.” These plants came safe to hand, two of them were well furnished with good ripe seed, and the tallest one measured 9 feet 3 inches in height. One of the other two, neither of which had flowered, was 5½ feet high, with seven branches; and the other was a 2 feet high young unbranched plant. These last two plants having lain with their roots fully exposed to the weather till the 14th December—in all about 6½ weeks—were then found so retentive of vitality that I had them replanted, with seemingly every prospect of success. This unusual vitality in unmaturing plants seems dependent on the larger proportion of mucilage which is contained in their bark.

Mr J. Smith, gardener, Lewis Castle, Stornoway, writing on the 6th of last November, states:—“The tree mallows raised from the seeds you gave me in June 1875 were much cut up by hares, which appear to be very fond of them. Of those left the tallest one is now about 7 feet in height, although it has not

flowered. I may state that last winter, or rather spring, was one of the severest on record about Stornoway, and more than the usual amount of snow fell, with which the ground was covered for nearly six weeks. The 2000 plants received this autumn from Messrs P. S. Roberston & Co. have been temporarily planted in the kitchen garden, where they will be safe throughout the winter from the hares, and will be retransplanted in spring. They are now growing nicely, not one of them having been lost." The Rev. James Ingram, U.P. Manse, Island of Eday, Orkney, in a letter dated the 4th December 1876, reports:—"My experience of the tree mallow cultivation has been confined to the garden here, where, with a south exposure and near a 7 feet wall, it attained a height of $9\frac{1}{2}$ feet, with 2 inches in diameter of stem, and there were numerous branches on all sides wonderfully prolific in beautiful red blossoms. It continued flowering three months, and almost the latest flowers produced ripe seed. The plants in the east and west borders were not so large, being only 6 feet high and proportionately small in other respects, but they produced a large quantity of ripe seeds. I have not had a single plant uprooted by the storms, though cabbages frequently suffer in that way." David Curror, Esquire of Craigduckie, writes from Rosythe Cottage on the 26th December:—"In 1875 about a dozen of the mallow plants, reared from the seeds you gave me, had attained in their second year to a height of 14 feet, with 9 to 10 inches in girth of stem above the ground. These plants blossomed freely, and a large quantity of seeds matured on each. An unflowered plant, raised from seed last spring, which I measured yesterday, was 83 inches in height by 8 inches in greatest girth of stem, so that the growth of the tree mallow has been a perfect success here, close to Rosythe Old Castle, on the north side of the Firth of Forth."

William Hay, Esquire, Rabbit Hall, Portobello, planted a number of tree mallows in 1871, where they were fully exposed to the north-east sea blasts, and where the hardiest of sea-side trees and shrubs did little more than merely retain a stunted existence. Here some of the mallows grew to fully 10 feet in height; and one, bearing a full crop of seeds, having been broken down in autumn 1872, these were greedily devoured by turkeys, and other domestic fowls that, having thus acquired a taste for them, proceeded to attack those on the standing plants, where it was amusing to see them flying up and holding on by the slender top branches, devouring every seed they could possibly get at. Writing subsequently to Mr John M'Kelvie, schoolmaster, Kildonan, and Mr Robert M'Niell, Breadalbane Cottage in that vicinity,—to both of whom I am indebted for specimens and information,—they replied confirmatory of the liking for the mallow seeds displayed by domestic poultry. And this farther points to

their applicability for feeding winged game and many other kinds of wild birds. In addition to the *cattle-feeding* and *paper-making* properties of the tree mallow, it may be beneficially and economically employed for other purposes; such as—

Sheltering sea-exposed gardens, and other grounds. At a meeting with the Largo Naturalists' Field Club, some years since, the late Mr Dickson, one of the original proprietors and editors of the "China Mail," who then resided at Elie, in Fife, told me that his garden was so directly exposed to the sea winds and spray that he had to grow a hedge-like belt of the tree, or, as it is there called, the Bass Rock mallow, on the sea-ward side of his crops, for their protection, and that it answered that purpose admirably. At a meeting of the Scottish Arboricultural Society, held on the 1st of November last, I recommended the tree, or as it is sometimes called the sea mallow, as a nurse for sea-exposed young plantations, it being peculiarly adapted for affording protection to the young trees before these attain sufficient sizes to shelter one another. When thus employed it is advisable to sow the mallow seeds in nursery drills or beds towards the end of June, so that they may not flower next year, and transplant them as soon as they are 4 to 6 inches high, where the forest trees are to be planted next spring. For succession, another planting of like sized mallows should be made in July or August following, to remain green and so maintain the shelter after those first planted have seeded and been harvested. Afterwards the seeds that will get scattered annually, even with careful harvesting, will suffice to keep up a sufficient succession as long as the sheltering aid of the mallows may be needed.

That "*nutritive mucilage*," which is peculiar to the *Malvaceæ*, or mallow family, and for the esculent, emollient, and other properties of which the okra (*Hibiscus esculentus*), the marsh mallow (*Althea officinalis*), and others are much reputed, is also abundantly present in the tree mallow, from which it may be obtained in sufficient quantities to allow of its being used as a condiment in the less nutritious animal foods, such as cut straw, chaff, &c., in addition to its more extended employment in culinary dishes, comfits, and the manufacture of toilet soaps. The okra above mentioned is extensively cultivated in tropical and sub-tropical countries for its pods and seeds, the former in their young state being pickled like those of kidney beans; the latter impart a mucilaginous thickening to soups, and are used in the manner of green peas; when ripe they are boiled like barley, and roasted as a substitute for coffee. The okra has also been long recognized as a textile plant, and a patent has recently been taken out in France for making paper from its fibre, for which it is being extensively cultivated in Algeria. Its fibre is prepared solely by mechanical means, in a current of water, without any

bleaching agent,* a mode that is also likely to be applicable to that of the tree mallow.

For *green manure*, to be dug or ploughed into the ground, the rapid and luxuriant growth of the tree mallow renders it particularly suitable. Some have assumed that, in consequence of its immense growth, it must be a very scourging or soil-exhausting crop. In reality, however, this does not appear to be the case, for the plants have comparatively few, and by no means far-spreading roots, and throughout the whole period of their growth, but more especially in that of the first year, they shed an abundant, continuous succession of their large succulent leaves, which overspread the ground surface with a thick leaf-manure covering. Thus the plants are not only large producers of their own nutriment, but seemingly derive much of their sustenance from the atmosphere, as is evinced by the forementioned tenacity of life in the unmaturing plants.

For *distillation*, the seeds of the tree mallow are likely to be useful. A friend to whom I showed them, and who in America had much experience in distilling from buckwheat, as well as from Indian corn, and the ordinary cereals, stated he had no doubt but they would yield over a gallon of proof spirit per 50 lbs.

For the *textile and cordage* uses of the tree mallow, see after remarks, page 295.

Cultivation.—The tree mallow accommodates itself to a wide range of soils and situations, not excluding from the former bog-peat, if sufficiently drained to free it from stagnant moisture; and although it thrives inland provided the temperature does not fall too low, it is most at home on the cliffs, and among the earth-mixed debris of sea-side rocks, or among sea sand-hills on their partly consolidated slopes and hollows. Under cultivation it will grow on most soils that are suitable for ordinary farm crops, and in many places where the exposure is too much for these. Ordinary farm-yard manure may seldom be available for tree mallow culture, but a convenient substitute will often be found in those immense quantities of sea-weed or wrack that are often thrown ashore near places that are highly suitable for its growth. The droppings of sea birds on its native cliffs suggests the application of guano; and in inland localities common salt could not fail in being highly efficacious. The period at which plants naturally sow or disperse their seeds is generally deemed the best, or at least a good time for sowing them in their native countries. To this rule, however, the tree mallow may be deemed an exception; as a good many of its earliest fallen seeds vegetate in mild periods of the succeeding autumn and winter months; and although in very sheltered places these may escape yet in many cases most of them will succumb to the succeeding

* See "British and Foreign Paper-Maker's Review" for August 1875. p. 19.

winter and spring frosts. Hence it will generally be found preferable to sow the seeds between the middle of March and the end of April, as if much longer delayed many of the plants will not flower the next year, but assume a triennial in place of a biennial duration. The seeds being sown either in drills or broad-cast, the young plants, when about 6 to 10 inches high, should be transplanted to where they are to remain, or in case of the ground being then filled with an early crop, such as early potatoes or pease, they may be temporarily transplanted at 4 to 6 inches apart till such crop is removed and the ground prepared for them; when they should be planted out either by the dibber or plough at from 18 inches to 4 feet apart; till more experience shows the distances that are most suitable for them in different soils and situations. When to be grown on the most exposed sea-coasts, either as an exclusive crop or for sheltering young plantations, they should be planted out when about 4 inches high, or the seeds sown in the places where they are to grow. No plants—those of kale and cabbage not even excepted—stand transplanting better than those of the tree mallow; but when its seeds become sufficiently abundant, it may in some cases be found best to sow them by machines, and afterwards thin out the young plants as is done with turnips. Intending cultivators should guard against getting their seeds off inferior varieties, such as that of the Bass Rock, which is dwarfer, as well as more horizontally spreading and more branching than the one here recommended. They should also avoid getting seeds from Southern Europe or other warmer climates than those of its British habitats. This last precaution may be deemed as of only temporary application, seeing that from the number of experimental growers, and the quantity of plants they have already planted out, or that will be so sufficiently early next summer, an abundance of home seed for sowing, as well as for practically testing its cattle-feeding qualities, will be produced in the autumn of 1878. And as with other cultivated plants the tree mallow can doubtlessly be improved by selection, careful cultivators will do well to select their “stock seeds” always from the best plants.

The thrashing or separating of the seeds from the stalks or haum, may either be done by rippling combs, as with the flax; by flails, or by machinery. It is probable that it may be found advisable to cut off or separate the seed-bearing twigs from the thicker branches and stems, as doing so would likely facilitate the after operations of stacking or storing, thrashing, and peeling.

Peeling or stripping off the bark is easily done at all times during the growth of the plants, and only a little less so when the seeds are sufficiently matured for pulling or cutting the crop; while even after the stalks are dried by stacking, or standing

them out on end through the winter, the bark comes off quite freely if they are saturated for a short time in water, or even thoroughly wetted by rain.

The principal advantages to be derived from the cultivation of the tree mallow are its production of two crops or returns—*seeds* and *fibre*—either of which would alone remunerate its growers; its suitability for extensive districts which are now almost worthless, or only capable of bringing low pasture rents; the prevention or abatement of river pollutions, as little if any caustic soda or other deleterious chemicals will be required in the preparation of its fibre; its resistance of injury from wet weather at, and after harvesting. And for the encouragement of such as wish to try it where the winters are occasionally too cold, it may be stated that plants of only one season's growth will yield a profitable return of good fibre, should they happen to be killed by frost.

In addition to the forenamed Scottish habitats of the tree mallow, it is also indigenous on some parts of the south-west of England and Welsh coasts; while in the "Cyble Hibernica," by Dr David Moore and Alexander G. More of the Glasnevin Botanic Gardens, it is stated to be found wild in five of the twelve divisions that therein comprise the map of Ireland, only one of which is on its eastern, and the other four on its southern and western coasts. So that in the western and northern coasts of Scotland, its Western Isles, the Orkneys, and probably the Shetland Isles, added to the other sufficiently mild temperatured districts of Great Britain and Ireland, it may be safely inferred that a much greater extent is available for tree-mallow culture than would suffice for all the wants of our home paper manufacturers,—and that without lessening materially the land surface presently devoted to ordinary agricultural crops. Continental Europe, it may be remarked, is too cold in winter for the *Lavatera arborea*, except those districts which border on the Atlantic and Mediterranean; and the same may be said of the Northern United States. In short, as beforementioned, no place is suitable for its regular cultivation where the temperature frequently falls below 15° Fahr. in winter.

In Lawson's "Agriculturists' Manual," published in 1836, the *Lavatera arborea* is included in the section "Plants Yielding Fibre," from its having been shortly before recommended by M. Cavanilles for "producing a very strong fibre which may be employed for making ropes," &c. In August 1876 Lady Orde kindly favoured me with the perusal of a letter from Mr Freer of Rayden, Norfolk, in which he stated that Mr William Billington, who was deputy-surveyor for the woods and forests at Chopwell, Durham, and afterwards "resided at Ray Towers on the west coast of county Mayo, where, exposed to all the storms of the Atlantic, *Lavatera arborea* flourished in native

wildness, recommended its fibre for paper making. He also used it in his garden for tying instead of bast; but the use of its seeds as cattle food does not seem to have occurred to him." In a syllabus of lectures on substitutes for paper material, delivered by Dr W. Lauder Lindsay at Perth in 1858, the "tree mallow" is named in conjunction with the common mallow, in a list of 75 paper-yielding plants. In September 1875 Dr W. L. Lindsay directed my attention to an article "On the Manufacture of Hemp and Paper from the *Lavatera arborca*," which was read before the Royal Dublin Society on the 25th of March 1859 by Mr Robert Plunkett, and published in the "Natural History Review" for that year. Having failed to obtain a copy of that publication in Edinburgh, I applied to Dr D. Moore of the Glasniven Botanic Gardens, who being equally unsuccessful in Dublin, kindly had the article copied verbatim, and sent to me on the 16th of December last,—from which it appears that at the said meeting were exhibited "products of the sea tree mallow, patented by William George Plunkett, July 29, 1857. No. 2069." These products were taken from plants over 6 feet in height, that were sown in spring and cut in October; as well as from a year and half old plants of 10 feet in height. They consisted of three specimens of hemp, made from the bark of the stems and branches; card boards made from the fibre and wood of the plant, of which those from the wood were lightest in colour; together with five kinds of rope and cordage; but no paper seems to have been shown. Mr Plunkett having, however, sent a series of specimens to Mr Cooke of the Trinity House Museum, Lambeth, that gentleman, in a contribution to "The Art Journal" for the 14th of January 1859, stated that "another patent, or rather series of patented paper pulps, are those of Mr Plunkett of Dublin, whose papers are made from four different kinds of plants. These are the tree mallow, red clover, hop bine or straw, and the yellow water iris; to the first of these we may look perhaps for the most satisfactory result." Mr Cooke farther added, that "specimens of the plant, wood, hemp, cordage, fine thread, and lace made from the bark, together with paper made from the wood, I shall be happy to show any one interested in the experiment." This employment of the heart-wood for paper-making is confirmatory of the anticipated use of it as stated in my previously recorded letter to the Highland and Agricultural Society, page 287. In a recent conversation with Dr D. More, he told me that, when at the Brussels Great Centennial Horticultural Exhibition last spring, the cultivation of the *Lavatera arborca* for papermaking in Belgium was then talked of by several gentlemen he met. But it is feared that Belgian winters are generally too severe to admit of this being done successfully. The "Gardeners' Chronicle" of 11th November last

contained an abridged copy of my letter, quoted at page 287, which was concluded by the editorial remark, that “years ago the utilization of this plant was suggested by the late Mr Hogg and by the editors of this journal.”

The above series of quotations show that I have no claim to the original discovery of the tree mallow being a fibre-producing plant, although my attention was drawn to it in entire ignorance of these prior claims. Hence my investigations and experiments with it are likely to be the more useful, from having been conducted independently of previously ascertained facts and failures regarding it. The use of the seeds for feeding, and some of the other purposes for which I have recommended the plants and their products, have, however, claims to novelty; and I trust that the means I have taken to bring its merits fully before both cultivators and manufacturers may result in the complete realization of the advantages herein held out to both. A usual question that has been put to me is: If the tree mallow is really so useful as you represent it, how does it happen that its usefulness has not been previously known? The preceding paragraph shows that its properties have not been altogether, although partially, overlooked; but even such as were ascertained do not seem to have been brought under the notice of those most deeply interested in any practical form. A patent taken out for the manufacturing of mallow fibre is just one of that class most likely to be shelved or laid aside and no more thought of. For in the first place a manufacturer requires a large and constant supply to justify him in making the requisite machinery alterations to allow of the new material being successfully wrought out; and he would have to set about providing for his new supplies of material about two years prior to the first crop being produced. And in the second, place few tenant farmers, even if permitted by their leases, would care to embark in experimental cultivation of any kind that would take about two years before pecuniary returns could be realized, and that more especially in the face of patent restrictions. Hence it is only by the combined efforts of landlords and manufacturers that tree mallow cultivation and its products can be fairly introduced. But when this is once successfully done tenant farmers, if allowed, will soon take to this new branch of agriculture.

In order to facilitate the exchange of opinions regarding results among the growers; and that other interested parties may know where to see, and judge for themselves, the following list is given of the names of those who up to the date of publication have embarked in the cultivation of TREE MALLOW:—

His Grace the Duke of Argyle, Inveraray Castle.

His Grace the Duke of Buccleuch, Dalkeith Park, &c.

- His Grace the Duke of Richmond and Gordon, Gordon Castle.
 His Grace the Duke of Sutherland, Dunrobin Castle.
 The Most Noble Marquis of Ailsa, Culzean Castle.
 The Right Hon. the Earl of Derby, Knowsley.
 The Right Hon. the Earl of Stair, Lochinch House.
 The Right Hon. Lord Kinnaird, Rossie Priory.
 The Right Hon. Lord Henry Scott, Beaulieu, Southampton.
 Sir E. C. Dering, Bart., Surrendew-Dering, Kent.
 Sir J. D. H. Elphinstone, Bart., M.P., Logie Elphinstone.
 Sir James Matheson, Bart., Lewis Castle, Stornoway.
 Sir J. P. Orde, Bart., Kilmory, Lochgilphead.
 James Alexander, Esquire of Red Braes, Bonnington.
 John Anderson, Esquire of Denham Green, Trinity.
 Alexander Baird, Esquire of Urie, Stonehaven.
 C. Bates, Esquire, America Farm, Doyenham.
 John Binning, Esquire, Brae, Dingwall.
 Colonel F. Borroughs, Island of Rousay, Orkney.
 James Brown, Esquire, Goodrington House, Devon.
 Henry Bruce, Esquire of Ederline, Ford, Ardrishaig.
 John Bruce, Esquire of Sumburgh, Shetland, and Fair Isle.
 Higford Burr, Esquire, Aldennaston, Reading.
 ——— Callingford, Esquire, 7 Phillimore Gardens, Kensington.
 J. J. Calman, Esquire, Carrow House, Norwich.
 Donald Cameron, Esquire of Lochiel, M.P., Auchnacarry.
 Blanchard Clapham, Esquire, Algoa Bay, South Africa.
 Charles Davidson, Esquire, Kirkwall, Orkney.
 William Delf, Esquire, Great Bentley, Colchester.
 Jerome Dennison, Buegar House, Evi, Orkney.
 ——— Drattry, Esquire, Oakdale, Holmwood, Dorking.
 Charles Duncan, Esquire, Woodend, Island of Bute.
 James Duncan, Esquire of Benmore, Kilmun.
 H. Newby Fraser, Esquire, Home Farm, Roseneath, Kilcreggan.
 R. W. Ganssen, Esquire, of Brookman's Park, Hatfield, Herts.
 A. Gibson, Esquire, Dunedin, Otago, New Zealand.
 John Gordon, Esquire of Cluny.
 A. M. Sutherland Græme, Esquire, of Græmes' Hall, Orkney.
 David Milne Home, Esquire, of Wedderburn, Paxton House,
 Berwick.
 Edward Humphries, Esquire, Mount Pleasant Hall, Worcester.
 James Hunter, Esquire, 1 Doune Terrace, for the Neilgherry
 Hills, East India.
 Rev. James Ingram, U.P. Manse, Island of Eday, Orkney.
 Charles Jenner, Esquire, Easter Duddingstone, Portobello.
 Professor G. Lawson, Halifax, Nova Scotia.
 Charles M. McDonald, Esquire, Largie Castle, Island of Islay.
 Kenneth Mackenzie, Esquire, Dundonnel House, Ullapool.
 Angus Mackintosh, Esquire of Holme, Inverness.
 George Marwick, Esquire, Bu Farm, Hoy, Stromness, Orkney.

H. K. Morran, Esquire, Inveryne, Tighnabruaich.
 Walter Ovens, Esquire of Torr, Torr House, Castle Douglas.
 H. N. Palmer, Esquire, Down Place, Harting, Petersfield.
 Dr Robert Paterson, St Catherine's, Inveraray.
 Donald Robertson, Esquire of Pennyghael, Island of Mull.
 J. M. Robertson, Esquire, Acuttipone Tea Co., Cachar, East India.
 John Shaw, Esquire, Bowden, Manchester; and Southport
 Gardens, Liverpool.
 William Sim, Esquire, Rosefield Nurseries, Forres.
 John Tod, Esquire, St. Leonard's Paper Mills, Lasswade.
 Colonel Tomlin, Orwell Park, Ipswich.
 Charles Turner, Esquire, Royal Nurseries, Slough.
 J. W. Webb, Esquire, Cradley, Malvern, Herefordshire.
 A. P. Welch, Esquire, Hart Hill House, Luton, Bedfordshire.
 Monsieur A. W. Welch, La Tour, Ajaccio, La Corse, France.
 James Young, Esquire of Kelly and Durris.
 Messrs J. Ballantyne & Son, Nurseries, Dalkeith.
 Messrs A. Cowan & Sons, Valleyfield Mills, Penicuik.
 Messrs Robert Craig & Sons, Newbattle Paper Mills.
 Messrs Dickson & Co., nursery and seedsmen, Edinburgh.
 Messrs Little & Ballantyne, nursery and seedsmen, Carlisle.
 Messrs P. S. Robertson & Co., nursery and seedsmen, Edinburgh.
 Messrs E. Sang and Sons, nursery and seedsmen, Kirkcaldy.

ON THE POLLED ANGUS OR ABERDEEN BREED OF CATTLE,
 AND THE MEANS THAT HAVE BEEN OR MIGHT BE USED
 FOR ITS IMPROVEMENT.

By THOMAS FARRELL, Aspatria, Carlisle.

[*Premium—Ten Sovereigns.*]

Introduction.

THE past quarter of a century has seen important changes in the agriculture of Great Britain. Twenty-five years ago, the object of the British farmer was to cultivate as much grain as possible, for this was the staple of the people's food, and the *ultima thule* of the grower's ambition. Since then, the population of both England and Scotland has increased; commerce and manufactures have extended; and the position of the working classes has been considerably ameliorated. Once the cry was for bread; now the constant call is for bread and meat, or rather, we should say, for meat and bread. The bulk of our bread stuffs is now imported from the fine grain-producing countries, where, during the growing season, fierce and uninterrupted sunshine almost exclusively prevails. Against such favoured lands the farmers of Britain, with their low summer temperature and variable climate, have little chance of competing, and heavily-freighted vessels are hitherward bound at all seasons of the year, in order

to supply our markets with those important commodities we can no longer grow entirely for ourselves. Butchers' meat, once regarded as a luxury among the working classes, is at the present time looked upon as a necessary, and forms a part of their everyday diet. With respect to the import of animal food, all attempts have hitherto resulted in partial or entire failure,* so that the community of meat-consumers must look to the farmer at home to supply their requirements. This is the cause why beef and mutton have been enhanced so much in value—rates being almost double what they were twenty-five, or even twenty years ago. In order to keep pace with the times in which they live, agriculturists of almost every degree have drifted in either to mixed farming, or exclusive stocking. Flocks of sheep have multiplied; cattle-breeding, rearing, and feeding have been more industriously prosecuted, and many sorts of extraneous feeding substances introduced, with the view of furthering the desired object, namely, the early maturity and rapid development of stock. With this brief notice of the marked agricultural changes which have occurred within the experience of the present generation of farmers, we pass on to the subject of our report—the polled Angus or Aberdeen breed of cattle. The rapid rise in the price of butchers' meat could not fail to arouse the breeders of the black skins to greater exertion, for they are alike noted for hardihood, early maturing qualities, firmness of flesh, and being capable of converting a minimum amount of farm produce into a maximum quantity of animal food for the support of the great human population. The breed has, therefore, of late years, got into the good graces of graziers and cattle-feeders, who generally have an eye to the financial aspect of the question, and is not only supplanting other less-favoured cattle upon the soil which gave it birth, but is also gradually gaining preponderance over the native cattle in the districts adjoining.

The Home of the Race.

We have already intimated that the polled Angus or Aberdeen tribe is rapidly extending the breadth of its territory. It is now no longer confined to the shires of Forfar and Aberdeen, where it had its origin—if confined be a proper term to use in speaking of such an extensive tract of country—but the breed exists largely in Kincardine, Banff, Moray, and perhaps Nairn. A few solitary herds are also to be found dotted over various parts of Scotland, but not to the extent we should like to see them, for we feel confident they would answer better in many high-lying districts than the bovine race which presently inhabit them. The six counties lying in the north-east of Scotland, which we have already

* Since the above was written, the American beef trade has sprung up, but whether it will have a lasting effect remains to be proved.

named, form the district in which the polls are chiefly reared. A line drawn from Fort George on the Moray Firth to Dundee on the Firth of Tay, constitutes the south-western geographical limit; on the north and east, the ocean is the boundary line. The district thus defined forms a large isosceles triangle having for its base the north coast, and Dundee for its apex; the entire area embraced by the triangle being 2,857,968 acres. Of this 1,226,558 acres are regularly under cultivation; two-fifths being under corn crops, principally oats, with a moderate amount of barley and very little wheat; one-fifth under green crops, chiefly turnips; and the remaining two-fifths being occupied by grasses under rotation. The uncultivated portion consists of high mountain chains, large stretches of moor and morass, and extensive plantations. Some of the mountain peaks rise to a considerable altitude. Thus it will be seen that the land to which the breed is indigenous, or that to which it has in recent years extended, is exceedingly diversified, varying in character from well-sheltered valleys to bleak and barren moors, or from comparatively low grounds to high mountain peaks, rising almost to the height of perpetual snow.

The following shows the number of cattle within the district in each year since the publication of the agricultural returns issued by the Board of Trade:—

1866,	240,573	1871,	289,666
1867,	269,272	1872,	302,476
1868,	302,038	1873,	303,592
1869,	289,982	1874,	317,662
1870,	291,643	1875,	319,687

The increase in the number of cattle during the past ten years has been remarkably steady, being 79,114 in the aggregate, or an uprise of 33 per cent. These figures are sufficient testimony that there has been no apathy on the part of the farmers in this part of Scotland, and it may safely be said that the improvement in the individual character of the stock has been quite as marked as that in the numbers. How many of the 319,000 cattle owe their parentage on both sides to the polled race would, in the absence of statistics bearing directly on the point, be difficult to say, but it is beyond dispute that a considerable proportion belongs to the type under notice and its crosses. In addition, there is still a somewhat large number of the native horned breed in the high-lying lands; here and there a herd of shorthorns and their affinities; a few West Highlanders; a sprinkling of Ayrshires; and a wonderful display of mongrels. Saving shorthorns, where a pure herd is kept as at Sittyton, and a few sires for crossing purposes, the black skin is gradually encroaching on the domain of every other race, and bids fair in

time to become the principal, if not the sole breed in this part of the

“Land of brown heath and shaggy wood.”

Being an intermediate race between the mountain types and those of the richer plains, Doddies thrive well, for a healthy constitution and a disposition to fatten early seem to be as much the special characteristics of the polled Angus or Aberdeen, as is a heavy-milking propensity of the neat little Ayrshire; hardihood and aptitude to withstand extreme privation of the majestic West Highlander; or, the capability to adapt itself to any country or climate of the valuable shorthorn.

Distinguishing Features.

Polled Angus or Aberdeen cattle, both masculine and feminine, are pleasing objects to the eye, inasmuch as they are finely and symmetrically made, are graceful in movement, have good constitutions, and are yielding to the touch. The modern poll is much improved in appearance over its ancestors of the beginning of the present century. This has been attained by the care exercised by breeders in the selection of useful sires, and catering for those points which breeders call “good,” and which now stamp the genuine type. Altogether there are few if any breeds which for general usefulness could compete successfully with the black skins in their native districts, being well adapted to the climatic and physical character of the country and the mixed system of farming practised therein. Belonging partially to the high-lands and partially to the level plains, the race is eminently calculated to thrive in a country diversified by mountain-chains and well-cultivated fields. Possessed of hardihood sufficient to enable it to withstand the asperities of a varied climate, the poll is the animal *par excellence* for northerly and exposed situations, as it has a disposition to thrive and fatten upon the produce of the fields with little or no artificial food, and when ripe for the butcher is a splendid weigher, bringing down the scales against apparently much larger animals of other breeds. This proves that it is not height that constitutes size, but length, width, depth and solidity of flesh. The chief points or characteristics of a well-bred polled Angus or Aberdeen bull are:—A nicely formed head well put on; eyes bright and prominent, and a good breadth between them; a clean throat and sweet muzzle, with not too great a distance from eye to nose; a high poll, and ears moderately sized. The neck should be long, clean, and somewhat full on the top; shoulders broad, but joining without abruptness to both neck and chin; the chest deep and expansive; the legs somewhat short, clean-boned, and supporting the body firmly. The back level and straight; ribs nicely sprung; barrel deep and full behind the shoulders, ensuring a large girth; well

ribbed home towards the hooks, which should be level and moderately wide apart, but not too broad for the other proportions ; and evenly fleshed to the tail. The twist full and long ; well-fleshed but not protruding behind ; the tail of medium thickness and hanging straight down.

The head of the cow ought to have a more elongated shape and feminine aspect than that of the bull ; the ears of good size : the neck clean, straight, and well put on, with neither abrupt hollow where it joins the shoulders, nor prominence on the top ; and the shoulder thinner and sharper on the summit than in the male.

In short, the head is fine, as becomes both sexes ; the carcase round and low ; the legs short, and the shoulder in keeping with the other parts.

The skin should be soft and pliant to the touch, and covered with a luxuriant crop of silky hair. When in motion, truly-bred animals have an easy, springy, and stylish action. The colour is mostly black, though occasionally animals of great purity are met with of a brindled cast ; a few brown along the spine and around the muzzle ; others again, of equally pure descent, have patches of white upon them. Black is the colour most breeders cultivate, although we have often found that the brindled and those with brown spines are capital milkers. It is therefore to be inferred that large indications of milk have their corresponding colours ; notwithstanding this, milking families may be cultivated with care, and the jet black of fashion strictly adhered to.

The chief points in the breed have been summed up in the following rhyme :—

Annexed will be found in rhyming detail
 The points to be seen in a polled Angus male.
 The head should be stylish, and neatly set on,
 And the distance from eye to the nose not too long ;
 Clean throat and sweet muzzle, bright prominent eyes,
 With the poll pretty high, and ears of fair size.
 The neck long and clean, somewhat full on the top ;
 The chest quite expansive, and deep in the drop ;
 The legs should be short, though not to an extreme,
 Nor the shoulders too full to the eye ever seen ;
 The top free from sharpness, yet not over wide,
 The back should be straight and level beside ;
 The ribs nicely sprung ; a deep barrel as well
 Ribbed close to the hooks, if he must excel.
 The twist full and long, not protruding behind,
 The tail of nice thickness, and clearly defined.
 The hair soft and silky, below and above ;
 Skin mellow and yielding as a lady's kid glove ;
 Each part well developed, yet proportionate withal ;
 The gait light and graceful when leaving the stall.
 The cow should not have the broadly-set head,
 But one strictly feminine adorn her instead ;
 The neck well put on, straight, even, and clean,
 With no abrupt hollow, neck and shoulder between.

The latter much thinner than that of the male,
 A sign that she's sure to excel at the pail ;
 Jet black is the colour, that with breeders goes down,
 Though a few polls are spotted and others are brown.

Such are the points of the improved breed at the present day, and such breeders are endeavouring to cultivate and fix upon their favourite type.

History of the Breed.

In order to trace the origin of the polled Angus or Aberdeen cattle, it will be necessary first of all to ascertain what descriptions of stock prevailed in the countries whose name they bear, previous to the era of improvement. Mr George Lumsden, Anquhorities, who is described by Mr McCombie as "the greatest living authority on the subject, whose recollection goes back much farther than 1808, who was one of the few who first brought feeding to perfection in Aberdeenshire, and one of the best judges in Scotland," says—"Since my earliest recollection three-fourths of the cattle in Aberdeenshire were black and polled, and this was the original breed of the county. The celebrated breeders and feeders in the beginning of the present and end of the last century, viz:—Messrs Robert Walker, Wester Fintray; the Harveys, Bedlston and Daneston; Mitchell of Fiddesbeg; Lumsden of Eggie; the Williamsons of St John's Wells, Bethelnie and Crichtie, and Ardmurdo, and Captain Stoddart, bred and fed pure Aberdeens."

Three-fourths of a century ago Mr Lumsden himself bought stots two and a half years old for L.30 a head in spring, and sold them at Christmas at from L.40 to L.45. These statements at once guarantee that the Aberdeen stock was even then of no inferior order, for at that time figures as high as those we have quoted were rarely heard of in connection with the best bovine tribes. Mr Lumsden continues:—"The polled Aberdeenshire are the best of all the best yet produced, and had they got the same feeding which is now given to the shorthorns, would have surpassed anything I have seen in that class, and, moreover, I think the county would have sustained no loss although the shorthorn had never crossed the Dee."

Mr Lumsden may be speaking somewhat with the partiality of affection; nevertheless, this living testimony falling, as it does, from the lips of a thoroughly practical man, is of the utmost value in determining the position of the black skins as a commercial stock in Aberdeen at the beginning of the present century. His views are also in part confirmed by an account of the breed given in the history of the county published in 1811, which states that Aberdeen is a breeding county, and raises a larger number and value of black cattle than perhaps

any other in Scotland. We also have it on undoubted authority that the polled breed were the almost exclusive inhabitants of the lower grounds, the horned types being chiefly confined to the high or hill districts. At Aikey Fair, early in the century, thousands of polled cattle were shown—not a horned beast to be seen; and so with many other important fairs. The merits of the best cattle will be understood by referring to the following weights extracted from the history of Aberdeen. W. Garden Campbell, Esquire of Troup, reared an ox that weighed 115 English stones, and sold eight stots at L.40 per head to Deacon Williamson, Aberdeen. Two Freemartins were killed in Aberdeen, which weighed respectively 1218 and 1030 Dutch lbs. and 7 stones 5 lbs., and 10 stones 17 lbs. of tallow,—the stone of tallow being 26 lbs. Dutch. Two oxen killed in Aberdeen, fed by a Mr Walker, brought down, avoirdupois weight, 1978 and 1976 lbs. These were fed solely on the produce of the farm, cake being then unknown.

The cattle of the county, even at this date, are described as having been much improved of late by crossing the most beautiful and best formed females with the purest males of the breed to which they belong. Moreover, we are informed from the same source, that the breeders of cattle endeavour to improve the size of the native stock by good keeping. These points are very important, and will serve to check an erroneous impression which at present prevails, namely, that the improved Aberdeen cattle were formerly horned. We have already alluded to the fact that there was a horned breed in Aberdeenshire at the time named, and we are also quite aware that the injudicious mixing of these with the polled breeds gave rise to every conceivable shape and colour of crosses. Therefore, horned cattle, possessing in other respects all the characteristics of polls, were quite common, and have doubtless led many into the error of supposing that the whole of the Aberdeen polled cattle were formerly horned. The original polls were generally fair milkers, and the dairy produce towards the end of last century was something considerable.

The history of Angus, published in 1813, gives some interesting particulars relative to the native cattle of that county. The permanent stock, we learn, constituted various breeds, which differed very much from each other, both in shape and quality. The report goes on to say, “that little attention is paid to the selection either of the males or females by whom the breed is propagated; and no pains have been taken to elicit a breed distinguished by any peculiar properties, either as a good milking or as a good fattening breed.” The calves were not always carefully reared. Some farmers, with the view of economy, reared them on hay-tea, skim-milk, and the juice of boiled turnips,

which rendered them feeble and paralytic. But the report **must** be taken generally and not exclusively. Many herds of **black** cattle were carefully reared even during the last quarter of the eighteenth century, and cases were not unfrequent of oxen whose four quarters exceeded 100 stones.

Thus much for the polled types of cattle which were to be found in Angus and Aberdeen early in the present century. And before proceeding to notice the race of improvement which for the past seventy years has been gradually going on, let us examine another point which crops up. It is asserted by some breeders of the present day, that the Aberdeen cattle and those of Forfar originally constituted two separate and distinct tribes. In proof of this, they draw attention to the difference in the external appearances of the cattle. Though admitting a general resemblance, they point out what they term distinctive features, in the quality of the hair, thickness of the skin, length of ear, size of the animal, and other exterior variations, which, say they, stamp them as separate types. But it is well known what effect climatic influences, quality of soil, breeding, feeding, and general management have upon stock of the same blood when brought to bear upon it for successive generations, and therefore, what the claimants for two stamps of cattle call *distinctive features*, may have been entirely caused by a combination of influences such as we have particularized. For ourselves, we have never noticed any points in the unimproved cattle of the two districts which are irreconcilable, or which would be likely to lead an impartial observer to believe that they constitute two separate races.

To proceed a point further. It is now acknowledged on all hands that what we may call for convenience sake the two tribes have at length merged into one. The blending has certainly been happy in its effects; just what we might expect if the members of a large stock were separated and removed to different quarters, and after a considerable lapse of time again brought together and the blood intermingled.

The repeated crossing of *distinctive* tribes almost invariably results in deterioration; after the first cross the progeny become ill-proportioned and weedy.

We have introduced the last subject *inter alia* in order to show that if the polled cattle formerly represented two distinct or separate types, then the blending of the tribes—the co-mingling of the blood—has produced results at once satisfactory and exceptional.

With respect to improvement in the polled stock, the late Mr Hugh Watson, Keillor, has the well-merited honour accorded to him of being the first improver of polled Angus cattle. The nucleus of his herd consisted of six cows and a bull of the Angus type received from his father. Not satisfied with their merits,

he bought ten of the nicest heifers and the best bull he could procure at the Trinity Muir, Brechin. This was in the year 1808, when the improvement may be said to have commenced. Afterwards the Keillor motto seems to have been—"Put the best to the best, regardless of affinity or blood." The herd is still well represented by that of Mr Ferguson, Kinnochtry, who has some very superior animals.

Improvers of the breed were, however, at work almost, if not quite, as early as Mr Watson, and therefore to them belongs no inconsiderable share of merit in bringing the doddies to perfection. The principal of them were :—Messrs Mustard of Leuchland and Fithie ; late Lord Panmure ; late Mr Thomas Collier, Hatton ; Sir James Carnegie ; Earl of Southesk ; Mr Fullarton, Ardestie ; Mr Scott, Balwyllo ; Mr Ferguson, Kinnochtry ; Mr Ruxton, Farnell ; Mr Lyall, Arrat ; Mr Whyte, Spott ; Mr Goodlet, Bolshan ; and last, but not least, the late Mr Bowie, father of the present Mr Bowie, Mains of Kelly.

For many years there has been a mutual interchange of cattle between the north and south districts, but Mr Bowie maintains that, before the time of rinderpest, the migration of animals northwards far exceeded those coming south. Mr Bowie himself has sent about a score of bulls, independent of cows and heifers, north within the past twenty-five years, four of them having been Highland Society's first prize takers, while in turn he has only had two bulls from the north fit for service.

However, as already stated, a mutual interchange of stock between Aberdeen and Angus has been going on for many years, and the finest strains of the two counties having thus been judiciously blended, birth has been given to a race of stock which is difficult—for meat-producing and early-maturing principles—to excel, and to which the appropriate title of polled Angus or Aberdeen cattle has been given.

Notes on Polled Herds.

Before describing a few of the leading herds of polled cattle, we may notice briefly that in Angus and Mearns there are fewer breeding stocks than there were a dozen years ago. Rinderpest made serious havoc in many a noble fold—as one owner remarked : "They (the cattle) were smitten as if with a passing breath." Still there are yet some fine herds between the Dee and the Spey, indeed, we believe that the black skins were never more numerous or better represented in that quarter than they now are. In many other districts they are gaining ground, and supplanting the native races. Within a very few years, however, death has removed some most ardent lovers of the breed. Amongst these we may mention the names of Colonel Fraser of Castle Fraser, Mr Robert Walker, Portlethen ; Mr George Brown,

Westertown; Mr James Skinner, Drumin; and Mr Alexander Paterson, Mulben, all of whom were *connoisseurs* in the art of breeding, pioneers in the general improvement, and great admirers of the polled type of cattle. We have also to lament the loss of Mr Dingwall Fordyce, M.P.; Mr Morison of Bognie; Mr Arthur Glennie, Fernyflat; Mr John Collie, Ardgay; Mr Robert Hector, Montrose, and several others, who, although perhaps not so well known to fame as the names of Walker, Brown, and Paterson, which had become household words with pedigree breeders, were nevertheless cultivating the race with great care, and extending its usefulness and popularity over a large area of country. Some of the herds alluded to are still kept up to a high standard of perfection, while a few others have since been dispersed. Quite recently—in October last—the Mulben fold, which has, since the death of Mr Paterson, been under the management of Mr Sutor, Elgin, was disposed of, when 21 cows averaged L.40, 6s.; 15 heifers, L.30, 4s.; 9 heifer calves, L.23, 4s.; and 6 bull calves, L.20, 6s. Amongst the purchasers were the Earls of Aberdeen and Strathmore, Sir G. Macpherson Grant, Mr M'Combie of Tillyfour, and other well-known breeders of polls.

But while within the past six or eight years there have been a few herds dispersed, there has, on the other hand, been a great accession of noblemen, landed proprietors, and farmers to the list of breeders. Included are the names of the Marquis of Huntly; the Duke of Richmond and Gordon; the Earl of Aberdeen; the Earl of Seafield; Lord Lovat; Lord Clinton; Sir William G. Gordon Cumming, Bart. of Altyre; Mr Brodie, Lethen; Mr Walker, Geddes; Mr Forbes of Culloden; Mr T. L. M. Cartwright, Melville House, Ladybank; Mr Hamilton, Skene House; Mr D. A. Pearson, Johnstone Lodge; Mr Grant, Methlic; Mr Hannay, Gavenwood; Mr Brooks, Cardney, Dunkeld; Mr Gwyer, Biallid; Mr M'Gregor, Kincaig; Mr Wilken, Waterside of Forbes; Mr Gordon, Tullochallum; Mr Farquharson of Banchoir; Mr Keir of Kindrogan; Mr Small of Dirnanean, with several others. We likewise understand that the Earl of Strathmore is presently establishing a herd at Glamis; and that another is being formed by the Hon. Baillie Hamilton, Langton, Duns, for whom purchases were made at Shevado. A herd is also being commenced by Mr J. H. Bridges, younger of Fedderate. Mr Bridges bought a bull calf at Shevado, and he has just purchased, at a long price, two in-calf heifers from Mr Walker, Montbleton. These are of Mr Walker's Mayflower family, and were first as a pair at the Turriff show in 1876.

Most of the folds which have been in existence a few years comprise not only fine individual animals, but also magnificent families. We have been kindly favoured by some of the owners with particulars as to the origin, descent, &c., of their herds; these

we give below in order to show the general management of this valuable breed.

1. *The Tillyfour Herd*.—As this now famous herd has often been described in newspaper articles and reports, and also by the owner himself at full length in a book entitled “Cattle and Cattle Breeders,” we merely give a list of the principal bulls and cows used in the herd, from Mr M'Combie's own pen. “The following Aberdeen and Angus bulls have since 1832 been used extensively here, viz :—Monarch (44), Victor (46), Rob Roy Macgregor (267), Tam O' Shanter (491), Angus (45), Black Prince (366), Hanton (228), Derby (377), Jim Crow the 3d (769), Major of Tillyfour (509), President 4th (368), Bright (454), Gladstone of Tillyfour (458), Champion (459), The Chancellor (460), Remarkable (482), the Shah (680), &c.

“So much for the bulls; now as to the females. The first female of note was an Aberdeen cow, from the late Mr Wilson, Netherton of Clatt. (The cow that the late Mr Robert Scott, Balwyllo gained the first prize with at the Highland Society's show in 1847, and the first prize at *Windsor* in 1851, was bred at Tillyfour—her dam was Mr Wilson's cow.) The next was a celebrated first prize winner of the Highland Society, from Mr Walker, Montbleton—an Aberdeen cow. The third was another first prize winner, from the late Mr Watt, Ranniaston—an Aberdeen cow. Then followed Duchess, from Castle Fraser, second prize, Royal Northern Agricultural Society's cow; Jenny Lind, from Mr Pirrie, Collethie, first prize Highland Society's heifer; Jane Ann and Princess, from Mr Ruxton, Farnell—Princess was a second prize cow at the Angus show; Anabella, from Mr Walker, Wester Fintray, first prize winner at Royal Northern Agricultural Society's show. Then came a first prize Highland Society cow and heifer from the late Colonel Dalgairns, of the Angus breed; the celebrated cow the Queen Mother (348), at the Ardestie sale, from Mr Fullerton, then a yearling heifer of the Angus breed; four heifers from the late Mr Scott, Balwyllo, of the Angus breed; three cows and heifers from Mr Bowie, Mains of Kelly—Angus cattle; four cows and heifers from Keillor; seven cows, the best of the herd, from the late Mr Collie, Ardgay—all pure Aberdeens; two from Easter Skene—Aberdeens; four cows and heifers from Mr Tayler of Glenbarry's sales—Aberdeens; two from the late Mr Brown of Westertown's sale; two from Mr Walker of Portlethen's sales; one from Mr Skinner of Drumin's sale; one from the Ballindalloch sale; two from the sale of Mr Barclay, M.P.; one from Mr Brown of Linkwood's sale at Morayston—all Aberdeens. By private bargain from Mr Reid, Baads, I bought the first and second Highland Society's yearling Aberdeen heifers at Inverness, and several cows and heifers from Mr Scott of East Tulloch. These have all been

bought without reservation as to price. The above enumeration brings up the principal purchases since 1832 to the present time. It will thus be seen that the Aberdeen and Angus polled breeds are here blended together; and that not a single horned animal has been introduced into the herd."

The fold at Tillyfour we may say has few rivals, and its worthy owner has raised the black skins to a standard of excellence which redounds greatly to his credit.

2. *The Mains of Kelly Herd.*—Very few, if any, breeders of polled cattle have been more successful than Mr A. Bowie, Mains of Kelly. He avers that the breeding of black skins has been a labour of love with him for more than forty years; moreover, he was trained to the business, for his worthy father was one of the first improvers of the race, and was thus contemporary with the elder school of breeders.

The late Mr Bowie bought his first cow at Boysack, on the property of Mr H. A. F. Carnegie, of Spynie and Boysack, in 1810 or 1811. She was named Boysack; in colour was black with a little white on flank, and had a white udder. She was of large size, a fine milker, and thoroughly doddied. An offshoot from this cow produced Jenny (55) who produced Rosa of Kelly (828), and, by the help of Colonel of Ardestie (329), produced Cupbearer (59), than whom scarcely a better bull could be bred. When the property of Lord Southesk, who kept this favourite animal till he was ripe in age and honours, being eight or nine years old, his blood flowed freely into all the counties where Angus male blood was desired.

Such was the origin of the famous Mains of Kelly herd. Mr Bowie's method has been to breed in line from Panmure and Old Jock on the male side, and while he has always kept in sight the maxim "put the best to the best," he has done it judiciously, avoiding violent crossing. Although Mr Bowie has had the honour of owning such celebrated cows as Old Favourite, the dam of Angus (45), Queen Mother (348), Lola Montez (202), and Black Meg (11), yet their progeny have not come to the front in the showyard in past years equal to those from the old Mains of Kelly and West Seryne cows.

But rinderpest made sad havoc in the herd, only 21 being saved out of 93 head! And yet Mr Bowie's lot was not so hard as that of some of his neighbour breeders, whose herds were completely stamped out.

Of late years, by perseverance and that consummate skill and judgment in selection and crossing which alone tend to satisfactory results, Mr Bowie has again raised his fold to the desired standard of excellence. We might say much more on the merits of this splendid herd, but we reserve further remarks until we

come to speak of the rearing and general management of polled cattle.

3. *The Ballindalloch Herd.*—This fine old herd, the property of Sir George Macpherson Grant, Bart., presently numbers about 80 animals, and is one of the best managed in the district. In his book on "Cattle and Cattle Breeding," Mr McCombie of Tillyfour wrote about ten years ago: "Perhaps the Ballindalloch herd of polled cattle are the oldest in the north. They have been the talk of the country since my earliest recollections, and were then superior to all other stock. The herd has been kept up to its wonted standard, and even raised higher by the present proprietor, by selection from the best herds in the kingdom." Early in the current century the herd at Ballindalloch had attained considerable repute; and Mr James Mackay, who was overseer upon the estate for forty-one years, well remembers how superior the stock was when he undertook charge of it in 1835. There was then no herd-book of black polls, the first being issued in 1862, but many breeders had nevertheless become fully alive to the superior character of the black skins. Sir John Macpherson Grant, father of the present baronet, paid much attention to his herd. An old catalogue shows that in 1850 he purchased, at somewhat high figures, two cows at the public sales at Tillyfour, which did much good service in the herd; but not till 1861, when the present owner of the property came to Ballindalloch, did the herd take a leading position in the country. At that time the nurseries of the best cattle were found at Keillor, Mains of Kelly, Southesk, Mains of Ardvie, Balwyllo, Portlethen, Tillyfour, Easter Skene, Montbletton, Mulben, Westertown, and at Ardgay. More improvement had been made at these places than at Ballindalloch. Sir George, however, found a fine foundation to work upon, and turned it to good account. In 1861 he purchased, for 50 guineas, Erica, one of the gems from Lord Southesk's fold. Herself a successful prize-winner, she became the founder of the Ballindalloch strain, which in later years took many leading honours at local and national shows. At the Highland Society's show at Aberdeen, last July, where the competition in polled cattle was keener than ever it had been before, no fewer than five of her descendants were in the prize list, some of them very high. Young Viscount, from Duff House, the first prize winner in aged bulls, is one of her family; so is Saint Clair, the winner of the two-year-olds at Aberdeen, and the one-year-olds at Glasgow. Eva, the pretty cow from Ballindalloch, which was second at the same show, is a granddaughter of Erica. Of this race there are still some noble animals in the herd. Eisa, Erica's calf of 1867, and the Highland Society's prize cow of 1871, is still as handsome as ever, showing a deep broad body on short legs with sweetness of shoulder, neck,

and head very seldom equalled. Some competent judges award her the palm as being the best cow ever the Ballindalloch herd contained. Enchantress, a seven-year-old cow, and a noted prize-winner, is also still in the herd, as well as Eva, one of the loveliest representatives of the race that can be imagined.

Jilt, obtained from the stalls of Tillyfour in 1867, was the founder of another favourite tribe. Though several summers have somewhat dashed her bloom, she is still a cow of great size and many good points. She is dam of the bulls Juryman and Judge, which have often been crowned with victory. Two well-made cows, Jewel and Jewess, are also of her progeny, so that she has brought forth a race or family of J's difficult to compete with.

The Nosegays are the most ancient family in the herd. The oldest representative was, we believe, sold last autumn, when fifteen years of age.

The next strain which claims attention was founded by Sibyl (974), whose portrait adorns the "Herd-Book"—and a capital portrait it is. She was bred at Bogfern, and, after gaining prizes at Aberdeen and Edinburgh, she came to the top as the first prize cow at the Highland Society's show held at Dumfries in 1870. It was at this show that the Ballindalloch herd acquired the high position in which it now stands. At Perth in the year following, the cattle from this fold were equally successful, and they still maintain the pre-eminent place they then acquired.

The Burgess tribe or family was descended from a cow bred by the tenant of Phonas, when he was at the Slack of Ballindalloch. Several of the descendants have taken high honours at the Highland Society's and other shows. Four of this family of B's were sold last autumn—Brunette, Bouquet, Blacklegs and Bridesmaid.

There are some smaller tribes in the herd, but the *creme de la creme* are undoubtedly included in the E's, the J's, and the B's.

The following bulls have been used :—Craig, out of a Keillor cow ; King Charles, bred at Southesk ; and Trojan from Tillyfour, which did more good in the herd than any other bull. To him lies the credit of imparting to the females the special characteristics which made them so popular with the public.

Victor, a Montbleton bull, had a short reign ; then came Juryman, a first prize winner everywhere, as he had fine style, was straight and level, and good in the shoulder and hindquarters. Scotsman, a Tillyfour bull, succeeded ; and the bulls in present service are Ballimore, bred at Westerton ; Elchies ; and Judge, the latter a yearling out of Jilt and got by Scotsman.

The herd, although well cared for, are free from pampering and over-feeding ; thus they combine hardihood with good breeding, and always turn out well when dispersed to other folds.

At the sale of surplus stock last autumn (1876), 21 cows, heifers, and calves drafted from this herd realized close upon L.48 each upon the average; the highest figure being 80 guineas, which was paid for Emma, of the Erica tribe.

4. *The Easter Tulloch Herd*.—Mr James Scott has here a very nice and promising herd of black cattle, of about thirteen years standing, during which time he has purchased from Mr Ferguson, Kinnochtry, several cows and queys, mostly descended from the Keillor doddies, containing among others, Princess (1026), Levity (1034), Mary (1035), Agnes (1966), Kate (1036), and Duchess (1028).

He has also purchased pure bred cows and queys from the Earl of Southesk; Mr M'Combie of Tillyfour; the late Mr Walker, Mains of Portlethen; Mr Strachan, Wester Fowlis, and others.

From the purchases effected from Mr Ferguson are presently in the herd 19 good cows and heifers, and 13 descended from those purchased at Southesk. Mr Scott also bought several cows from Mr Scott, Upper Tulloch, who had bred polled cattle for many years before he began his herd. He had several cows of the Portlethen and other breeds, as also Southesk bulls, but he kept no pedigree of his cattle.

From one of the Upper Tulloch cows, by a Southesk bull, Mr James Scott had Bluebell, and this favourite dam has bred some superior stock; among others, Tamerlane (392), which took first prizes at Laureneekirk, Aberdeen, and Dundee, and the Highland Society's second prize at Edinburgh; Prince of Wales 2d (934), which besides several local prizes took the first honours at the Highland Society's show at Edinburgh; Bluebeard (648), which as a two-year-old took in 1874 the first prize at the Highland Society's show at Inverness, and the first prize at the Royal Northern Society's show at Aberdeen.

The herd also includes seven cows and heifers descended from Bluebell, and she has this year (1876), a very superior bull calf, but unfortunately too late calved for showing next year.

Besides the bulls already mentioned, Mr Scott has used in his herd King Henry (390), Cavalier (411), and Theodore (393), all from Southesk, as well as Colonel (391), from Mr Leslie, The Thorn. Colonel gained the second prize at the Highland Society's show at Stirling in 1864. Other bulls were Kinnochtry (685), bred by Mr Ferguson, Kinnochtry; Emperor (396), purchased from Sir George Macpherson Grant of Ballindalloch out of his famous cow Eisa (977), and Westertown by Baron Setterington (356), from the late Mr Brown, Westertown.

From the above sires and dams Mr Scott's present herd of 42 cows, 14 two-year-old queys, 22 one-year-old queys, and 17 heifer calves has been chiefly descended. The animals are all

well-bred, healthy, and free from patchiness, and when fed are alike noted for making heavy weights and maturing early. Animals from what is called the improved breed have been tried at Easter Tulloch, but although they look promising as individuals, their progeny have not done well for Mr Scott.

5. *The Drumin Herd*.—This herd, the property of Mr William M. Skinner, has of late years risen into considerable repute. Long before the introduction of pedigreed stock, a useful herd of polled cattle was kept at Drumin. The first purchase of the improved race was a pair of black heifers from the Mains of Kelly. These turned out well, founded the present herd, and gave birth to the Lucy and Beauty tribes. The former is the most strongly represented at Drumin. It traces back to a good old stock, in which the blood of the Keillor and Portlethen tribes is largely mingled.

The Beauty tribe has also many points of excellence. Beauty of Drumin was the first of the family which showed great merit, and after winning many prizes and doing much service as a breeder in the herd, she was eventually sold to the Marquis of Huntly for 60 guineas. Mr Skinner next purchased three heifers from Morayshire. These heifers founded three races, known as the Eliza, Heatherbell, and Catherine tribes. The first of these, says the "Herd-Book," sprang from "a pure Aberdeenshire cow, bred at Daudaleith." Eliza of Drumin, now eight years old, is a fine cow, and has often taken the first card of honour. Her daughter Forget-me-not has won firsts at the Speyside shows from her early calfhood, and is a well-framed, fashionable animal. Members of the race of Heatherbell have also often stood first in the contest for ribbons, and are possessed of many distinguishing points of merit. The third of the Morayshire heifers founded the tribe now represented by Catherine, a fine seven-year-old cow.

New strains have recently been added from Portlethen and Rothiemay, and the herd, altogether numbering about 55, is one of the most select, thriving, and profitable to be found in the country.

The first bull that brought much merit to the herd was Defiance, out of Charlotte (203), Mr M'Combie's excellent cow, which took the first prize at Inverness in 1846, and the first prize and gold medal at Paris in 1856. Next came Marshal (399), a Tillyfour bull, which gave the herd size and constitution; afterwards Disraeli from Tillyfour; then Clansman and Talisman both from Rothiemay. The former gained many prizes, and was most serviceable at Drumin. The stock bulls now are Adrian 2d, a broad, deep, shortlegged bull; and Byron, a Drumin descendant from the Catherine tribe.

The characteristics of the herd are size, fleshiness, and superior

dairying qualities, fine temper and freedom from patchiness. Milking capacities have always been catered for, obtained, and permanently fixed. Most of the cattle are of large size and evenly fleshed. At the last sale but one, cows averaged L.43, 13s.; two year-old heifers, L.44, 10s.; yearling heifers, L.34, 13s.; heifer calves, L.26, 17s.; bull calves L.27; and as an evidence how good blood tells in feeding, we may say that Mr Skinner generally realizes in the London markets from L.42 to L.48 for his three-year-olds. At the draft sale last autumn (1876), 21 animals brought an average of L.40, 8s. all round, the highest price being paid for Forget-me-not, which made 66 guineas.

6. *The Rothiemay Herd*.—This herd, the property of Mr J. W. Tayler of Glenbarry, has been raised to a high standard of perfection by the owner, as the formidable array of prize cards sufficiently testifies. Kate 2d (1482), from this stock, was the first prize cow at Inverness in 1874, the first prize two-year-old heifer at Stirling the year before, and the second prize yearling at Kelso in 1872. Thus, as she grew up, she became more difficult to vanquish, and many breeders averred that she was the best heifer which had then appeared in the Scotch show-yards within the previous ten years. Many of the bulls used at Rothiemay have also taken a fair share of honours. In 1872 Mr Tayler had a sale of draft cattle which made good prices, and again in 1875, but unfortunately foot-and-mouth disease had been prevalent in the herd some time before, which would no doubt prevent some buyers from taking part in the sale, and to some extent flatten the competition. Nevertheless, high prices were realized for all classes of stock. The twelve cows sold brought an average of L.51, 3s.; a pair of two-year-old heifers, L.39, 7s.; four heifer calves, L.16; and three bull calves, L.29, 8s. The highest price was 70 guineas, which was paid for the cow "Fashion," bought by Mr Symon Tulloch, Dufftown; and also for a two-year-old heifer, "Orange Blossom," which fell to the lot of Mr Collie, Priestwells. The Rothiemay herd has many points of recommendation—robustness, good milking qualities, evenness of flesh, size, and fashion.

7. *The Auchlossan Herd*.—This herd, the property of Mr Barclay, M.P., Auchlossan, Aberdeenshire, has been in existence ten or twelve years. Though Mr Barclay has not paid so much attention to the stock as some breeders have, yet the animals comprising the herd have much merit, being of good size, well-formed, and evenly-fleshed. The foundation at Auchlossan was laid by the purchase of females from Tillyfour, Mulben, and Bogfern, and bulls were used of the Tillyfour and Westertown breeds which gave much character to the fold. Five or six years ago a bull, that had driven competition before him,

was bought from the late Mr George Brown, Westertown. This purchase proved very valuable ; and later, the Czar by the same breeder did good service. As prolific cattle and splendid milk-producers, the Auchlossan breed stand second to none in the district. Moreover, the herd has been reared to its present large dimensions at wonderfully little cost. The pastures at Auchlossan are naturally rich and healthy, but over-condition is strictly guarded against. This is one reason that the cows have all along bred so regularly, and brought forth a sound healthy progeny. As the opinion of the public is generally a safe one, particularly when it is expressed in L. S. D., we give the prices of the draft cattle sold from this fold in October 1875. Thirty odd animals realized in the aggregate upwards of L.2000 ; cows averaging L.35, 16s. ; two-year-old heifers, L.33, 5s. ; year-old heifers, L.28, 11s. 8d. ; heifer calves, L.14, 8s. 9d. ; and bull calves, L.18, 12s. 9d. A few oxen also brought good figures.

8. *The Cortachy Herd.*—This herd, the property of the Earl of Airlie, dates from 1869, and numbers from 80 to 100 animals. Amongst the first females purchased were Victoria of Kelly (345), from Mr Bowie ; New Year's Day (1124), Jessica 2d, and several heifers from Mr Whyte, Spott. In 1870 it was augmented by additions from Mulben, Aldbar, and Burn herds, and in 1871 by several animals from Spott, Thorn, and Mains of Kelly. Recently, Tillyfour, Easter Tulloch, and Johnstone Lodge blood has been introduced, so that the herd is full of fashion, and many of the cows are excellent milkers.

The first bull was obtained from Mr Goodlet, Bolshan, from which place he took his name. Westertown, bred by the late Mr Brown ; Easter Skene, by Mr McCombie ; Jim Crow, from Mains of Kelly ; and Ballot, from Mr Tayler of Glenbarry, followed in succession. Then came Juryman from the Ballindalloch herd, which did good service. Belus (749), is now the stock bull, and is a fine animal ; but whether he will prove as good as his sire remains to be seen. The stock are thus all well descended, and not being pampered are healthy and good breeders.

At a draft sale held last October, 7 cows averaged over 41 guineas each ; 6 two-year-old heifers, 32½ guineas ; 4 yearling heifers, 43½ guineas ; and the grand old bull, Juryman, 57 guineas. Altogether the sale was a good one.

Many other useful herds might be noted if time and space permitted, but we must forbear.

Rearing and General Management.

With slight variations in matters of detail, the feeding and management of calves and young stock are much the same in all the best herds. In order to illustrate these features, we

believe that we cannot do better than adduce the example of Mr A. Bowie, Mains of Kelly, who, as we have already intimated, was bred to the business, and has had, so to speak, forty years' apprenticeship. His remarks do not refer simply to the food bestowed, the shelter provided, and so on, but taking a much wider range, they bristle with information on many important points connected with the management of the black skins.

We have previously stated that the breeding of polled cattle has been regarded as a labour of love by Mr Bowie. He has adhered to them in the firm conviction that for beef-producing, properties of the finest quality, hardiness, and early maturity they are the most suitable breed for Scotland and other countries. Some of Mr Bowie's stock reached New Zealand many years ago, and he has had the pleasure of hearing from the owner that his bovine antipodes are succeeding well in that fine climate.

Mr Bowie has been very successful in the breeding of bulls both for home and outside service. He might also have had fair success as a competitor at the national shows with animals of the female class, but never save once—at Perth in 1871—exhibited a female at them, simply because he declined to destroy their breeding properties by turning them into hard fat, only fit for butchers' meat, and probably over fed even for that. He adds: "Perhaps to this circumstance I owe my success, such as it has been, in breeding males, because, right or wrong, I have been accustomed to think how can a calf be properly developed in a womb already filled with hard fat?" Hearing of the extraordinary fat females at the Highland show at Aberdeen this year, he cannot but lament that this over-feeding is seriously on the increase, in fact, the shows are merging into fat competitions rather than for giving encouragement to cattle breeders.

As a frequent judge at the Highland Society's and other shows, Mr Bowie admits that a certain amount of flesh is necessary for proper judgment, and to set the animal off to advantage, but he is of opinion that this can be attained by feeding on ordinary farm produce—turnips, straw, and grass. In his own management he often limits the first of these supplied to one and two year old heifers, and always to in-calf cows not giving milk, just to prevent the laying on of fat, an excess of which in his opinion also destroys the milking properties. From the results of this experience he believes the Highland Society should have a rule to the following effect:—"That no breeder or exhibitor—on oath—shall be permitted to show a female of any age, calves excepted, that has been fed upon other produce than the ordinary turnips, straw, and grass of the farm." Indeed he has found that these articles given in moderation do not prevent his finer types of females from getting too fat.

If breeders will feed to excess, Mr Bowie is of opinion that they should confine this treatment to the males, as in his experience he has found that the service of a fat bull is surer than that of a lean animal, and giving extraneous food as oilcake, &c., may pay when the animal reaches the butcher. Forcing a female for a paltry prize of L.10 or L.15 is ruinous; nay, absolute cruelty. Mr Bowie then states that he has dwelt long upon this subject, because he believes that many polled breeders are getting into the rut of the shorthorn fanciers, and that their over-kindness, if this be a proper term, is being manifested in lumps and patches, which in his eyes are odious.

Mr Bowie further states, that although his breeding stock have paid him well, his butchers' beasts have paid him better—ergo, the calves brought up by pail leave larger returns than those which breeders have suckled, as such get a cow to themselves. On the whole this is true, although in exceptional cases, where L.100 can be got for a single animal, there is more profit in the latter system, as the sum named will pay a cow's keep for eight years.

The remnant of Mr Bowie's excellent account we give in his own words, lest it should lose any of its force by our paraphrase. He continues:—"Rinderpest having nearly extinguished the polled herds in Forfarshire, I have now great difficulty in getting black calves to buy for feeding purposes. Although my bulls do good service in the district, such is the mongrel character of the cows that it is rare to get a black calf worth buying. The Ayrshire cow prevails hereabouts, and what are the crosses between Ayrshire cows and polled bulls? Why, generally wretched things!

"The calves reared by hand-pail seldom get more than from 3 to 4 Scotch pints (about 6 to 8 imperial quarts) of milk per day, but it is given sweet and warm from the cow. We commence with very small quantities, added to daily until 3 pints is reached at ten days old. At a month or six weeks, they are offered sliced Swedes, cut in pulping fashion, also oilcake, both of which they take readily to if milk is scarce. I distinctly disapprove of cooked food for calves, but certainly think they have been the better of a supplement of the "Albion food." Every calf thus reared has a loose box, 6 feet by 5 feet, fitted up with hay-rack and box for turnips or cake, and the earlier the calf, the better for the butcher, at, say from 2½ to 2 years old.

"Here let me remark on this point, that if the early calf, whether for breeding or feeding, be the best, why should the Highland Society shut out of their yard those calved before the 1st of January? In my opinion the calves should be born after the first or middle of November. If it were possible to have my whole complement of calves—say 25 to 27—thoroughly educated

to eat turnips, cake, and hay, and weaned from milk before being turned out to grass, all the better, but this means an excess of cows which might not pay."

Before closing this subject we may briefly allude to the systems adopted by the Earl of Airlie and Mr McCombie.

The calves on the farm of Cortachy, occupied by Lord Airlie, are mostly hand-fed, only a few being allowed to run with their dams. The best plan seems to be to keep the calves in thriving order, as liberal feeding during calf-hood does not impair breeding stock in after years. A good sappy condition should, if possible, be maintained, and there is nothing more conducive to this than allowing the dams to suckle their young for five or six months. After weaning, the females intended for breeding purposes are substantially fed, but by no means pampered, all forcing being judiciously avoided.

The breeding cows at Tillyfour—numbering 80 more or less—are kept as low as possible in the winter. Calves are usually dropped during the spring, and have access to their dams until the end of October, getting, in addition to the milk, from 1 to 2 lbs. of oilcake. When the weaning has been accomplished they have straw and sliced turnips with $1\frac{1}{2}$ to 2 lbs. of oilcake daily. The after-treatment of the females is somewhat difficult, avoiding an excess of fat on the one hand, and ensuring progressive development on the other. The heifers are rarely put to breeding until two years old, as they are apt to become stunted if used before.

Milking Properties of the Breed.

During the march of improvement which has been going on steadily for many years, and particularly in the last decade, we believe that we are right in stating that milking properties have not, as a rule, been catered for in the breed of polled cattle. Early maturing and heavy beef-making characteristics have mainly been sought after by the improvers, inasmuch as these seem to be the points in which the type excels, and can therefore be brought up to the highest standard of perfection. A few breeders, however, while not losing sight of the main properties possessed by the polls, have paid a little attention to the milking capacities as well; we therefore find some herds which are very profitable dairy cattle. The race, viewed as a whole, may be set down as fair milkers; of course not nearly equal to the Ayrshire, or cattle of the Channel Island, but far superior to many other breeds. The quantity given is larger than that of the West Highlander, but the quality falls short, although it is vastly superior to that of the shorthorn, which is sometimes given in large quantities and very thin. As in other breeds, there are good, bad, and indifferent milking families, according to the pains,

or otherwise, which have been bestowed upon the cultivation of this important faculty. Those who are anxious to secure females of this kind for the dairy should be careful not to be led away by the too-heavily fleshed animals. Where milk alone is a desideratum, we could not recommend the polled breed as being the most suitable, but, as we have said, if judicious selection be made, a race of cattle may be founded which will milk fairly well and make good carcasses of beef at the finish,—an important consideration, for, as Mr M'Combie truly says, "All cattle come to the pole-axe at last," so that this is one end which should be kept in view from the commencement. The quantity of milk, as might be expected, given by different herds varies very materially, perhaps more than in any other breed. Nice milkers will, however, give 16 to 20 quarts per day during the best of the summer season; others, a great deal more; some much less.

Growing Demand for Polls.

It is a notable fact, that since the establishment of a Herd-Book, there has been an increasing demand for nice polled stock. This has been particularly the case during the past three years, when every sale has been relatively better than its predecessor. The enhanced competition speaks well for the popularity of a breed which has long been somewhat extensively reared in the north-eastern counties of Scotland, but considering its hardihood and meat-producing capabilities, deserves to be scattered over a much wider tract of country. It is claimed for the polls that no other distinctive breed will bring such a large return for the quantity of food consumed, for, as Mr M'Combie truly says, pound for pound the meat is worth more than that of any other breed. As for hardiness, the cattle are second to none but the picturesque West Highlander, and in the matter of healthiness they stand in the foremost rank. The sales of last year (1875) eclipsed any in former years, both as regards prices realized and numbers sold. No less a sum than L.5922 was paid for animals sold in the season. The year previous, twenty-seven young polled bulls were recorded as having been sold; in 1875, the number ran up to fifty. These brought, in the aggregate, L.1398, 1s. 6d., or an average of L.27, 19s. 2d. for each bull. Owing to the dispersion of the Westertown and Indego herds, and the disposal of large drafts from Tillyfour and Easter Skene, a considerable number of polled females was offered for sale, being sixty against twenty-six in the year previous. The total amount brought in was L.2401, 9s. 6d., or an average for each cow of L.40, 0s. 5d. In 1874, thirty-nine heifers were disposed of; in 1875, seventy-four, of which twenty two-year-olds realized the high average of L.40, 16s. each, or a sum total of L.816, 15s. 6d. Forty-two one-year-old heifers made L.1096, 11s. 10d., or an average of L.26, 1s. 3d.

A dozen heifer calves brought L.210, or L.17, 10s. on the average. The highest averages in all classes were made by the cattle belonging to Mr McCombie of Tillyfour, and were as follows:—bulls, L.47, 5s.; cows, L.45, 15s.; two-year-old heifers, L.57, 17s. 6d.; yearling heifers, L.34, 19s. 3d; and heifer calves L.23, 2s. He also secured the highest prices for individual heifers and heifer calves, being for a two-year-old, L.79, 16s.; for a yearling, L.55, 13s.; and for a heifer calf, L.32, 11s. The bull and cow which sold for most money belonged to Mrs Brown of Westerton, for which L.99, 15s. and L.69, 6s. were made respectively. In the present season (1876) there have been several draft sales and one or two dispersions. The Ballindalloch and Drumin joint draft sale was the best of the kind ever held in the north, the spirited bidding and high prices paid affording strong testimony of how rapidly the polled breed is growing in popularity. In another part of the report we refer to the high averages obtained. At the Mulben dispersion, an example of the way in which the Tillyfour Prides are rising in value was furnished. Five years before, the late Mr Paterson paid 29 guineas for a calf of this noble family at Mr McCombie's sale. Notwithstanding two or three mishaps relative to the death of calves descended from her, the 29-guinea purchase with three of her progeny, realized L.283, 10s., or an average of L.70, 17s. 6d. per head. Examples like this afford ample proof not only that the black skins are profitable, but also that they are gaining esteem.

Feeding and Preparing for Market.

In order to show the great importance of cattle-feeding in the district where the polled breed forms no inconsiderable proportion of the live stock, we may state that it is computed that about 42,000 cattle are annually fed in the country lying round Aberdeen. These represent a total annual value of a little over one million pounds sterling. About 34,500 head are exported, either alive or as dead meat, to London and other large towns. Successful feeding may therefore be looked upon as a *sine qua non* in the farming of the part alluded to. As a striking example of this, we may adduce the practice of Mr McCombie of Tillyfour, than whom no better feeder can be found. The forward bullocks are tied up early and finish d off in October with turnips, cake, and straw. The larger and better sorts are usually destined for the F-llington, Liverpool, and Edinburgh Christmas markets, where they almost always come off conquerors in the peaceful showyard battles. Very little cake is given, and then only an allowance of 3 to 4 lb. daily, for a short time towards the finish. Indeed, the thriving qualities are so marked that the Christmas cattle are not unfrequently thought

too ripe by buyers. As the fat cattle go off, the stalls are filled by beasts bought in the neighbourhood, and either finished in spring, or kept over-year upon the pastures. The method of feeding stock upon Mr McCombie's farms is very simple. The cattle eat the best of the straw and the refuse goes for litter. The racks are carefully cleaned out twice a day, and the forestalls once. Turnips are given thrice a day; at six in the morning, then at twelve, and again at four, a barrowful being allowed between two cattle. Now and then the cattle are inspected, and the sluggish ones allowed 3 or 4 lbs. of cake with a like quantity of ground corn, so as to keep them up to a level with the tops. The beds are well shaken up two or three times a day in order to ensure comfort when the animals lie down.

Mr Reid, Greystone, is also an extensive feeder. He breeds a few, but buys in and fattens many more. He does not confine himself entirely to polled stock, but selects good crosses as well. His Christmas cattle have turnips at 6 A.M., 12, and 4 P.M., each animal consuming 9 to 11 stones daily. Good oat straw is supplied between the root meals, the refuse going for litter. Until the turnips are ready, tares and 3 lbs. of cake are given, afterwards the cake is discontinued until about six weeks from the time that the cattle are to be sold. Cake, bean-meal, and pease are all used as required; in some cases, a little hay is added. Mr Reid's great principle seems to be to keep the animals in a progressive state from the time they come into his possession.

Mr Adamson, Balquharn, also feeds a large number of cattle. His system differs very little from those just described. He allows turnips thrice a day, with straw between the meals thrown into the forestalls. About six weeks before market, 3 lbs. of cake are given in the morning and 4 lbs. of bruised corn at eight o'clock in the evening. The animals intended for the Christmas markets are housed in August, and fed with cut grass and ripened tares until the soft turnips are ready.

Most farmers who prepare polled cattle for the butcher, feed, with trifling modifications, as described above. The very fact that little extraneous food is required, speaks volumes for the improved breed. Many feeders prepare 50 to 100 animals for the market in the course of the year; others, 100 to 200; while Mr McCombie annually fattens 300 to 400, about 50 of which he breeds, the remainder, as already stated, being purchased in the neighbourhood during the spring months.

Polled Crosses.

Crossing the breed with other races has been extensively tried with various results. The small native horned breeds are often served with polled males, and the calves are naturally weedy mongrels. Mr Bowie jocularly alludes to the strange variety of

bovines by which he is surrounded, and says that they are of every colour and shape—"Greeks, Yankee Doodles, and Hindoos"—indeed he would not be surprised if a green bull were introduced before long. The Ayrshire and Angus crosses are fair milkers, but are useless for producing beef. The short-horn crosses are, however, worthy exceptions. With good strong polled females and a useful bull, the progeny are large in size and splendid feeders. Crossing in this way ensures early maturity and weight of carcase from the shorthorn side, while the poll guarantees constitution to withstand vicissitudes of climate and the property of making a comparatively small amount of food into a considerable weight of finely-marbled flesh. The blending of two such noble races as the shorthorn and the poll is generally successful if the female be on the polled side; the reverse is not attended with such happy effects. Since the wonderful improvement in the polled race, some feeders question whether crossing with the shorthorn brings either weight or early-maturing principles, while they say the quality of the meat is somewhat impaired; others look at the matter in another light, and prefer feeding cattle with a dash of shorthorn blood in their veins.

Improvement of the Breed.

In the body of this report we have furnished examples of the improvement which has gradually been taking place in the polled type of cattle for more than half a century. This has been particularly noticeable in the past twenty or twenty-five years, during which time some of the folds have been brought up to a high standard of perfection, and others are in a fair way for shortly achieving a creditable position.

Few points now remain to be noticed. However, we may mention two or three which naturally crop up as we muse upon this favourite type. In the matter of breeding, we are of opinion that many farmers, who are still content to raise cattle from ordinary stock, might very materially improve their herds by following in the footsteps of the great pioneers who have long ago paved the way and made the path smooth and even. By the purchase of two or three good females, they would be able, at a comparatively small cost, to lay the foundation of a superior stock, which by crossing with good bulls, and the exercise of care in the management, would yield a progeny calculated to fatten on a smaller amount of food, and be of more value when finished.

With respect to the rearing of calves, some breeders, we observe, allow either too little milk or give it for too short a period—sometimes both. This is poor—nay, false economy, for the calves become poor and stunted, and never afterwards attain to a large size. "Keep the calf-flesh on," is a maxim which should be deeply engraven on every breeder's heart. As to the matter of allowing the calves to suck their dams, or that of hand-

feeding, opinion is divided ; we, however, decidedly lean to the former system, as being the most natural and the best. There is no fear of the calves becoming so fat that their future usefulness will be impaired even by this liberal practice.

In after-life there is danger of over-feeding females, which should be zealously guarded against. This leads to another point. The pampering of show cattle as practised at the present time is positively injurious, and destroys the breeding properties of many a blooming heifer. On this subject, Mr Bowie, Mains of Kelly, makes some pertinent observations, which are given elsewhere in this report, and to which we can add but little, coming, as they do, from an experienced breeder and a good show-yard judge.

In conclusion, we may remark that, considering all the points of merit which the polled breed may justly lay claim to, it deserves its boundary to be much extended, as we feel confident that it would pay both the breeder and feeder far better than the weedy crosses which are found not only in many counties of Scotland, but also in various parts of England. May its merits become more widely known, and the area of its dominion considerably increased is the earnest hope of an enthusiastic admirer of the breed.

ON IMPLEMENTS SELECTED FOR TRIAL.

I. FISKEN STEAM CULTIVATING MACHINERY.

In 1871, the Fisken Steam Cultivating Machinery was tried at the late Marquis of Tweeddale's home farm at Yester, and at Offerton Hall, near Sunderland. Both of these trials were attended by members of the Highland Society's Committee on Machinery, and reports of the observations then made will be found in the 4th volume of the Society's Transactions by Professor Wilson, Mr Swinton, Holyn Bank, and the late Professor Rankine, then consulting engineer to the Society.

On perusing these reports, it will be found that circumstances prevented a full investigation being made, and that, while some defects in the machinery for conveying the power from the engine to the plough were noticed, there was nevertheless a general expression of opinion that the apparatus was admirably suited to perform the work required of it.

Since 1871 Messrs Fisken have improved their apparatus so much as to warrant them in applying to the Judicial Committee of the Privy Council for an extension of their patent, which was granted in March, 1876, for a period of six years. On the same grounds they exhibited a model of their apparatus, as now improved at the Society's Show in July last, at Aberdeen, and the Implement Committee, on consideration, recommended it for trial.

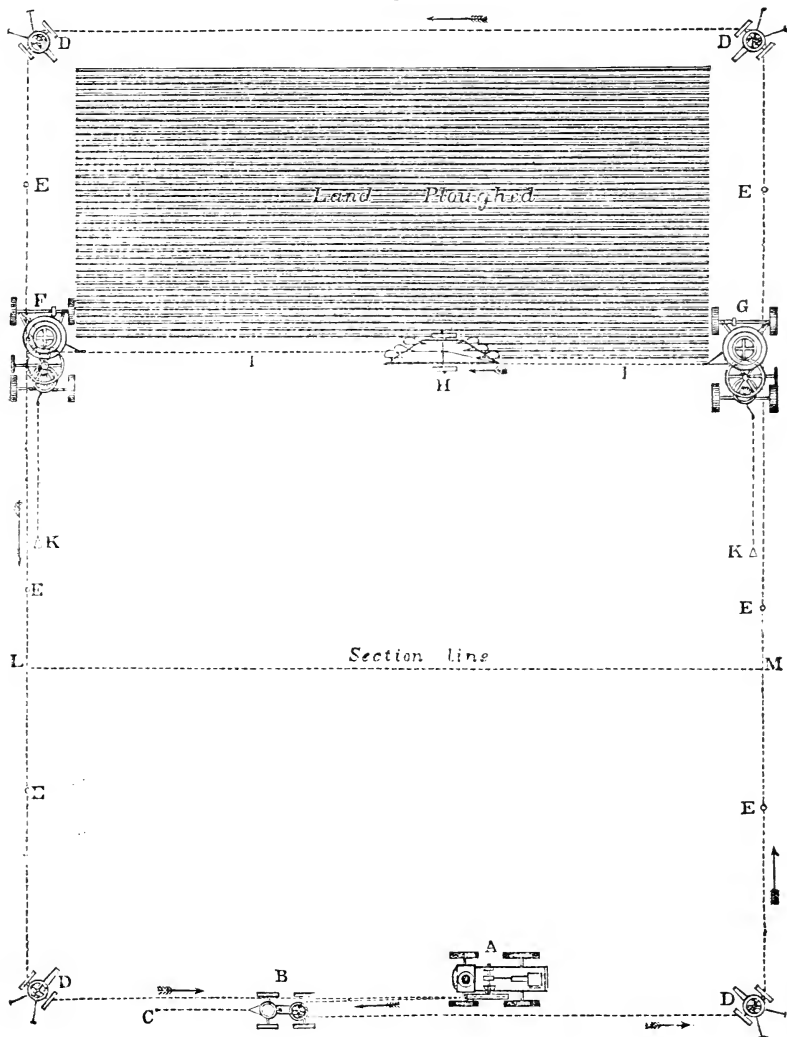
In accordance with this recommendation, the Fisken apparatus

was subjected to a series of trials, beginning on Tuesday the 14th, and terminating on the 18th November, on the farm of Liberton Tower Mains, the use of the ground and all facilities for making the trials having been kindly afforded by Mr Bryden Monteith, one of the directors of the Society. Thereafter, further opportunities occurred for testing the "System" on the farms of Mr Black at Liberton Mains, and Mr Gray at Southfield, both of these gentlemen having kindly given the Society the means of prosecuting their experimental inquiries.

Although the Fischen Tackle is pretty generally known, it may be convenient for those who have not had an opportunity of seeing it at work to describe, briefly, its action by reference to the accompanying wood-cut (fig. 1). The engine supplying the power is placed at A, which may be any convenient spot at the edge of a field. An endless hempen driving rope, measuring $\frac{3}{4}$ inch diameter, shown by dotted lines, passes round the grooved fly-wheel of the engine, and thence round the tension pulley B anchored at the point C, the use of which is to adjust the tightness of the rope. On leaving the tension pulley B, the rope is carried round the corner anchor, pulleys D, and intermediate porter pulleys E, and finally, after encircling the field to be ploughed, returns to the fly-wheel of the engine. The outline of the field to be ploughed need not necessarily be rectangular, as the rope can, by means of the corner pulleys and porters, be carried round an angle considerably larger or smaller than a right angle without notably affecting its working. F and G are two windlasses, between which the plough traverses, and H is the plough itself. The hempen driving-rope passes round a horizontal wheel, keyed to the upper end of the upright shafts of the windlasses F and G. On the lower end of these shafts is fixed horizontal toothed gearing, so arranged that it can be readily thrown out of gear, so that the endless rope may be driven without communicating its motion to the lower barrel of the windlass, round which is coiled the strong wire rope I which drags the plough. The engine, on being started, propels the endless hempen rope at a velocity which, during the experiments, varied from 20 to 25 miles an hour. Suppose the plough is required to commence its work at the windlass G, the windlass F is thrown into gear and immediately coils up on its barrel the wire rope attached to the plough (which is at the same time given off by the windlass G) at the easy rate of about two miles per hour, dragging the plough across the field from G to F. The windlass is thrown out of gear whenever the plough reaches F. The plough is *reset* for another furrow,—an operation which in ordinary working was found to occupy about half a minute,—the two windlasses are moved forward a few feet by machinery worked by the endless rope

winding up a rope anchored at K, and the opposite windlass G being then thrown into gear, the plough is drawn slowly back to

Fig. 1.



its starting point, so that it will be understood that the engine never requires to reverse or stop its motion, the endless rope continues to haul, and the action of the windlass in starting and

stopping the plough and its consequent reciprocatory action all go on without involving the necessity of any signals between the man working the plough and the man working the engine. The mechanism of the windlasses for regulating the movement of the plough, as well as that for moving them forward as the ploughing proceeds, is ingenious; but it is not possible, without reference to enlarged diagrams, to describe the various devices which the patentees have introduced in their endeavours to perfect their system.

The advantages claimed for the system by the patentees may be shortly stated, as follows:—

1st. The transmission of power from the engine by means of the fast travelling, light hempen endless rope.

2d. By the use of their windlasses, the fast motion of the endless rope can be applied to the slow motion required for the plough at any part of the field without stopping the engine.

3d. The use of one engine (and that may be any traction or portable engine of the ordinary type).

4th. The circumstance that the engine does not require to traverse the field to be ploughed, thus avoiding the risk of breaking drain tile pipes.

5th. The facility with which the power can be transmitted by the travelling rope enables the engine to be placed in a situation most convenient for the supply of water and fuel, the carts supplying which do not require to enter the field, the position of the engine being stationary.

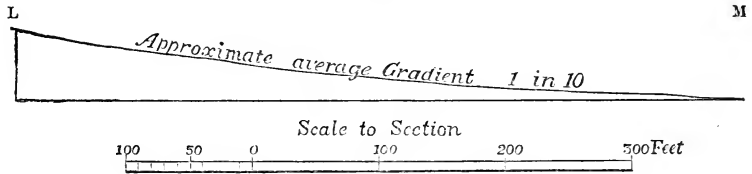
6th. The small quantity of land left in headlands, the breadth of which averages 14 feet.

In stating what have been represented as the points of superiority claimed for Fiskens's Tackle, the Committee must point out that the trial now to be reported on was not of a competitive character, there being no competitive system of steam ploughing with which to compare it, and therefore, in giving their report, they must confine themselves strictly to the result of the investigation now made on Fiskens's Tackle as represented in the model shown at Aberdeen. At the same time, they have to notice that the results of the present trials, though not embracing other systems of steam ploughing, and, therefore, not competitive, will nevertheless be useful should it be necessary hereafter to compare them with trials made on any other steam ploughing apparatus. Indeed, it seems doubtful whether two systems of steam cultivation could have been simultaneously considered at one competition in a satisfactory manner.

With these preliminary observations, the Committee proceed to give the following results of the various observations made, and the conclusions they have deduced from them.

The field selected for the trials on Mr. Monteith's farm has a surface which, according to the section fig. 2, has an average

Fig. 2.



gradient of about 1 in 10, which was considered not unfavourable to obtaining a fair working trial of the powers of the tackle. (The position of the section L M is shown in Fig. 1.) The field was in stubble, with a very liberal allowance of farm-yard manure spread on it. The soil may be called light and free from stones. The weather throughout the whole of the trial was wet and very foggy, but not so wet as to interfere with the proper working of the apparatus.

Engine.

The engine used during the experiments was one of Robey's patent traction engines, 10 H.P. (nominal), weighing 10 tons 10 cwt.

During the trials the fly-wheel averaged 140 revolutions per minute, giving an average speed to the driving rope of 22 miles per hour.

Plough.

The plough was Fiskens's patent three-furrow ^{tackle} plough, weighing 25 cwt., and cutting three furrows 8½ inches deep by 11 inches wide.

Dynamometer

The dynamometer used in the trials was that of Messrs Easton & Amos.

Draught of Plough and Tackle.

	Cwts.	qrs.	lbs.
The uphill average draught was	= 19	1	11
The downhill average draught was	= 13	2	2

Actual Difference = 5 3 9 = 653 lbs.

The theoretical difference of draught between the up and down trials, due to gravity, may be taken as follows:—

Weight of plough,	=	25	cwt.
Weight of man,	=	1.1	,,
Weight of steel rope,	=	1.1	,,
		27.2	cwt.

$$\frac{27.2}{10} = 2.72 \times 2 = 5 \text{ cwt. } \frac{1}{4} = 1 \text{ qr. } 16 = 604 \text{ lbs., the theoretical difference.}$$

We may therefore safely assume the average draught on level ground, with an $8\frac{1}{2}$ inch furrow in light soil, at 16 cwt.; and the correctness of this result deduced from trials on the sloping field was confirmed by trials made subsequently on a field that was nearly level.

Horse Power.

In order to determine the horse-power, the following observation were made simultaneously with those above given for the draught:—

Uphill average velocity was $127\frac{1}{2}$ ft. per minute, which gives 8.37 H.P.
 Downhill average velocity was 175 ft. per minute, which gives 8.02 H.P.
 So that the average horse-power may be stated at 8.2.

Draught of Tackle.

The dynamometer having been placed so as to occupy the position of the plough, it was found that the strain produced by the carrying rope, 1000 yards in length, and the two windlasses, was 2 cwt., the dynamometer moving at the rate of 151 feet per minute, and hence loss of power due to the Fischen mode of transmitting it = $\frac{151 \times 2 \times 112}{33,000} = 1 \text{ H.P.}$

Removals.

From the description of the apparatus given at page 2, it will be seen that the proper arrangement of the corner anchors, porters, &c., which is a feature peculiar to the Fischen tackle, is not a work which can be done by the ordinary run of farm-servants without instruction. It is also an operation occupying some time, for which an allowance must be made in calculating the cost of work done. The Committee had only one opportunity of ascertaining the time taken to set up the tackle, and it was found to be two hours, but this was under the direction of Mr Fischen's able assistants, and the Committee can hardly arrive at any *reliable result* from that single trial. They have, therefore, no alternative but to adopt Messrs Fischen's estimate of the cost of "removals" at two shillings per day.

Attendance and Wages.

Engine,	1 man,	at 28s. per week,	£1 8
Windlasses,	2 men,	at 22s. „	2 4
Plough steering,	1 man,	at 24s. „	1 4
Driving coals and water	} 1 horse, cart, and man,	60s.	„ 3 0

Total cost of attendance per week, £7 16
 Cost of attendance per day of 8 hours, £1 6s.

Consumpt of Coal, Water, &c.

On a trial extending over a period of 3 hours, it was found that the consumpt of water was equal to 1099 gallons per day of 8 hours; and the consumpt of coal for the same period was found to be 14½ cwt., which, at 9d. per cwt. = 10s. 10½d. per day of 8 hours.

Assuming a working day at 8 hours, we obtain from the above data the following as the cost:—

Wages, per day.	£1 6 0
Coal, „	0 10 10½
Oils, „	0 0 6
Removals, „	0 2 0

Adopting the calculation given in Messrs Fiskens's catalogue, as applied to tackle of the value of that under trial, we get the following result:—Cost of apparatus, L.866, “but as the engine will be employed to do thrashing, grinding, and chaff-cutting, &c., upon the farm, debit L.600 only to cultivator, which, at 15 per cent. per annum to cover repairs, renewals, interest of capital, and depreciation, will amount to £90, and working 100 days in the year will be equal per day to

0 18 0

Total cost per day, £2 17 4½

Cost of Work Performed.

It was found that on a trial of 3 hours, the work performed was 2A. 96P., which amounts to 6 A. 149 P. per day of 8 hours. But as the amount of work during the trials could not be kept up during a whole day, it cannot safely be used as a fair criterion, and we are disposed to think that the actual amount of ordinary work done would not exceed 6 acres in a day of 8 hours, which, at L.2, 17s. 4½d. per day is 9s. 6¾d. per acre.

The Committee are aware that doubts have been expressed as to the durability of the working tackle, a subject on which they have no personal experience to guide them. They have, however, no hesitation in saying that the tackle is simple in its construction, and not, in their opinion, liable to failure. But as the opinions of those who have used the apparatus may be reckoned of some weight, they quote ^{the} ~~the~~ opinions on this point from Messrs Fiskens's published notice of their patent. Mr Ingleton,

of Minster, Sheerness, says, "The windlasses are practically as good as when they left your shop four years since." Mr Finn of Black Friars, Canterbury, writing in 1874, says, "We had our set of Fisken's tackle in December 1871, and have ploughed 978 acres with it, and are still using the rope which came with it;" and Mr Fenigan of Talacre, North Wales, in giving evidence before the Judicial Committee of the Privy Council, states that "he had cultivated 1200 acres without a shilling of expense having been incurred in the repair of the windlass, and the tackle was still in good order, working every day."

In addition to the trials, the results of which have been described, the Fisken tackle was, as already stated, employed in farms in the neighbourhood of Edinburgh, and the gentlemen by whom it was so employed having been asked to give their opinion of the manner in which it performed its work, the following letters have been received:—

"LIBERTON TOWER MAINS,
"December 5th, 1876.

"DEAR SIR,—Yours of 2d instant to hand. My opinion of the work done on my farm by the Fisken plough is very favourable; the land was well ploughed, square taken out and laid properly back. I don't think it better than horse ploughing; it had this on my land to recommend it, viz., the bank being steep, it had more power than horses. I tried several at 12 inches; it did it as well as at 9 and 10 inches. A 12 inch furrow on my land would have required three horses. The plough could be so set as to plough any kind of furrow.—I am, very truly yours,

David Stevenson, Esq., C.E. (Signed) "BRYDEN MONTEITH."

"SOUTHFIELD, *Edinburgh*, 2d December 1876.

"DEAR SIR,—I am duly favoured with your letter of this date, asking my opinion regarding the working of the Fisken tackle.

"In reply, allow me to say that I am very much pleased with the work performed, and I am of opinion that it is superior to horse ploughing, and leaves the land in a better state for spring cultivation; and I may also state that all the practical farmers who had the opportunity of seeing here the work, and the working of the tackle, were highly satisfied. I may mention that in my field some boulders were met with, which will require to be all taken out, to save breakage and detention, and ensure successful working.

"In confirmation of my decided opinion in favour of the system, I have purchased the engine and tackle at present on my farm.—I am, yours very truly,

David Stevenson, Esq., C.E. (Signed) "WILLIAM GRAY."

LIBERTON MAINS, EDINBURGH,
22d December 1876.

"DEAR SIR,—I am sorry I have been so long in answering your note about Fisken's plough, but the reason is partly that I cannot say anything in praise of the work it did for me. I am very sorry, for I think very highly of the tackle, and have no doubt it will come into general use; but there is one thing certain, it cannot plough lea. The mild growing weather we have had has made my field ploughed by it look quite green, whereas the land ploughed by my own ploughs looks quite like winter.—I am, yours truly,

"David Stevenson, Esq., C.E. "ROBERT BLACK."

Two distinct questions arise in the investigation of steam

tillage—*First*, What is the best apparatus for transmitting motion to the plough? *Second*, Which is the best construction of plough for doing the work required.

The Committee's attention has been confined to the first, and, perhaps it may be added, the most important of these inquiries, for if it can be determined which is the most convenient and economical apparatus that can be used for steam tillage, the form of plough best adapted for particular soils may be matter for further investigation.

The perfect disintegration of the soil, so as to approach as nearly as possible to the action of manual spade-work, is the aim to be reached, and that must obviously depend on the kind of soil to be ploughed, whether clay or loam, for example, and hence the necessity of adapting the plough to the soil; and probably manufacturers may with advantage turn their attention to a still more perfect and easy means of adjusting the coulters and shares and mould-boards to the varying soils in which they have to work. This may in some measure account for the difference of opinion in the foregoing letters, though all of the writers, it will be remarked, give testimony to the satisfactory working of the tackle itself.

After duly considering all the information that has been brought before them, the Committee have to report that the Fischen steam cultivation tackle is based on the ingenious conception of communicating power to great distances, by means of a rapidly moving light rope; that the mechanical arrangements for carrying out the conception and applying the rapid motion of the travelling rope to the slow motion of the plough, as recently improved, are well designed, and that the "tackle" performs its work in all respects satisfactorily.

The Committee recommend that the Society should award to Messrs Fischen a premium of fifty guineas.

Having laid before the Society the result of their investigations, the Committee cannot close this report without repeating that the favourable opinions they have expressed of the Fischen tackle must not be held as warranting a conclusion in favour of that system as the best that has been devised for steam culture. From what has already been stated, it will be seen that such a conclusion would be altogether premature. Some members of the Committee are well aware of the amount and excellence of work performed by Fowler's improved steam tackle, and it is well known that there are machines by other makers equally worthy of attention. It is obvious, therefore, that until these other "systems" (for so they have been called) have been subjected to trials similar to those which the Committee have conducted, no opinion as to the *comparative* merits of the different systems of working can be arrived at.

It cannot be questioned that those whose duty it is to encourage any branch of scientific or practical research cannot at the present day afford to remain passive or inactive. New views, followed by new results, are yearly brought forward in every department of study, and whether such views be sound or false, they claim, and should receive full consideration. To this agriculture is no exception. The wide range of subjects embraced in its now acknowledged proper study includes, in those who seek the Society's diplomas and certificates, some popular knowledge of chemistry, natural history, veterinary surgery, botany, and engineering, and thus the Society acknowledges the general onward movement for inquiry, and while it may be a subject for difference of opinion in what may and to what extent the Society can best promote the dissemination of knowledge in some of those branches of study, it appears to the Committee that, as regards the construction and utility of new agricultural implements, no such difficulty exists. The appeal to a properly conducted trial is available, and the Committee regard it as a highly important function of the Highland Society to procure and supply to its members the best possible information on the merits of the different implements annually brought forward as new inventions, many of which have undoubtedly no good qualities to commend them.

The application of steam-power to the tillage of the soil is pre-eminently one of those subjects which, from its importance, the Committee think should be fully investigated, in order that agriculturists may be provided with *authoritative data* for their guidance in selecting the implements they employ; and following out this view, they are of opinion that every inventor who claims superiority for his system of steam tillage should be encouraged by the Society to submit it to a trial similar to that afforded by Messrs Fiskien, who, the Committee think, deserve the special thanks of the Society for the personal trouble they have taken in submitting their invention so fully and unreservedly for examination by the Society's Committee.

The Board approved of the report.

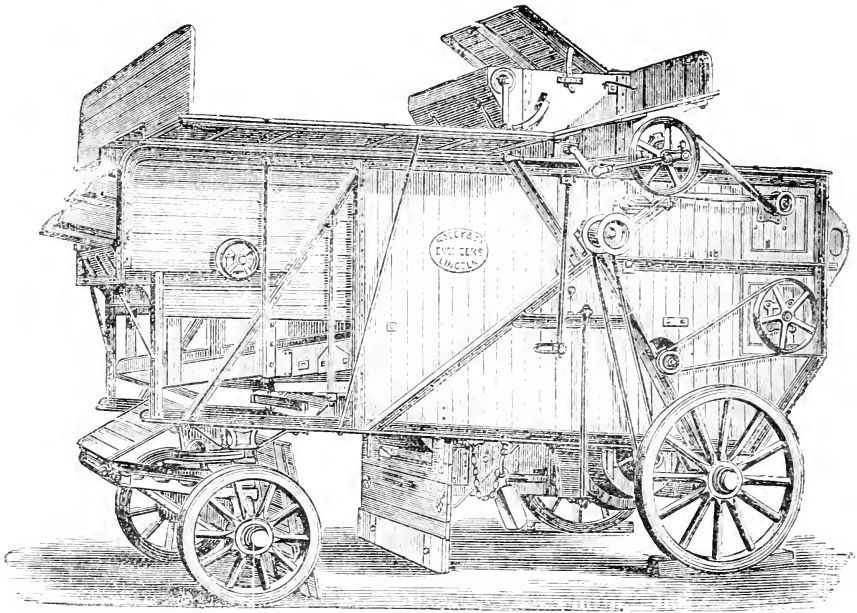
II.—ROBEY & Co.'s THRASHING MACHINE.

This machine (fig. 3) was exhibited by Messrs Robey & Co., Lincoln, and was tried with barley on the 15th, 16th, and 17th November at Mr Monteith's farm, Liberton Tower Mains. It is said to be of new design, and to embrace many improvements, chiefly the reduction of the weights of the shoes and riddles, and having enlarged bearings for the spindles. The lower part of the framework is also left open, so as to show the working parts, which is an advantage in regard to attention. The

patent self-feeding apparatus consists of a covered hopper on the top of the thrashing machine, containing a shaking-board, on which the crop falls as it is filled in, and means of adjustment are provided to regulate the quantity of feed. There is a lever close to the attendant, so that the machine can be quickly stopped if required. The price of the machine is L.160. The machine was driven by one of Robey & Co.'s six horse-power traction engines, and the quantity of grain finished for the market per hour was six quarters. The Committee consider that the work done was most satisfactorily performed; that the various improvements which have been introduced, especially the new feeding apparatus, are most ingenious and likely to be useful, and think it worthy of the Society's gold medal.

The report was approved.

Fig. 3.

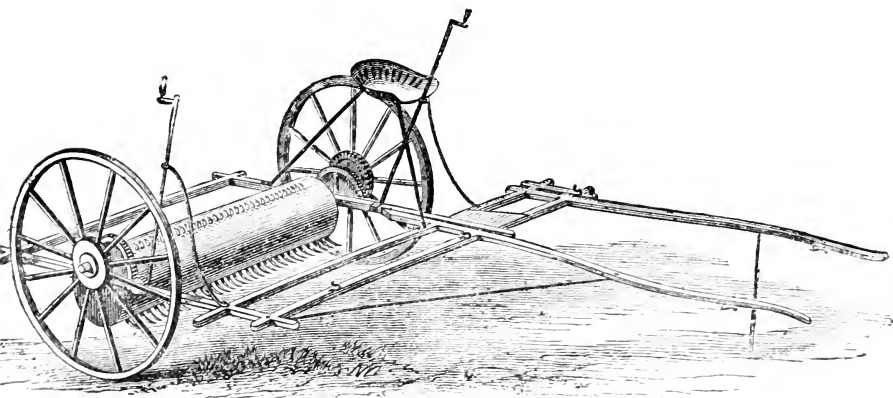


III.—KOLDMOOS' WEED ERADICATOR.

The weeding machine invented by Mr Ingermann, of Koldmoos, near Gravenstein, and for three years well known in Germany, Denmark, and Sweden, called "The Koldmoos Weed Eradicator," and exhibited by Messrs Ord & Maddison, Darlington, was selected for trial by the Implement Committee at the Society's show at Glasgow in 1875, and the trial took

place on Thursday 15th June, 1876, on the farm of Craigmillar, near Edinburgh. The trial was made on a field of barley which had attained the growth of from six to ten inches. The field was covered with a strong growth of mustard in flower; the ground on the day of trial was rather dry. The machine (fig. 4) takes in a breadth of four feet six inches, and was very easily drawn at a quick pace by one horse. It consists of a horizontal drum revolving between the carrying wheels. The periphery of this drum is pierced throughout its whole length by thin slits, from which, by a simple eccentric arrangement, moved by the rotation of the drum, three toothed comb cutters are alternately projected about two and a half inches, and again withdrawn within the drum. The maximum projection of the comb beyond the periphery of the drum occurs during the under half of its rotation, when the

Fig. 4.



combs are in contact with the corn and weeds. The weeds are thus caught between the teeth of the comb, and are either pulled up by the roots, or, if too firmly planted, their upper portions are pulled off. As the drum revolves, the combs carrying with them the weeds they have entangled, are gradually withdrawn into the slits, leaving the weeds they have taken up to be thrown off by the revolution of the drum. The comb having reached the highest part of the drum's revolution, and having thrown off all the cut weeds, is again gradually protruded, and prepared for making another cut in the lower half of its revolution. The revolution is rapid, and the cutting action of the blades almost continuous. The Committee are satisfied that the machine did useful work in removing the mustard while in flower, so as to prevent its seeding, and that many of the weeds were uprooted. It is possible that in practice a more favourable state of the ground and growth of the weeds could be selected for using

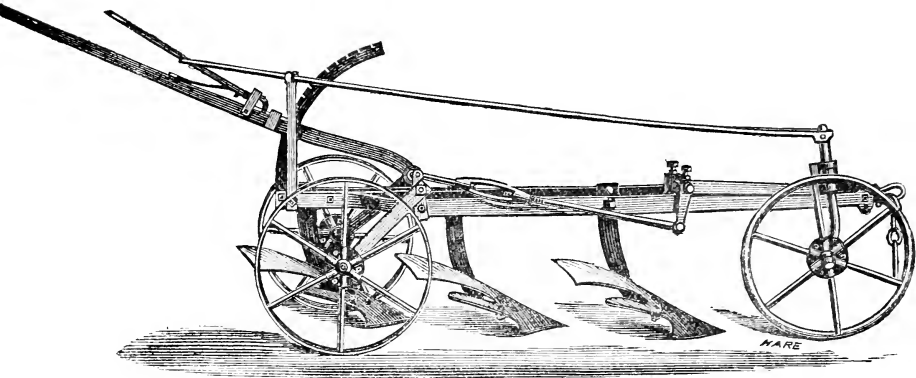
the implement, so that a greater number of the weeds might be pulled up. We have to report an important fact—that the barley received almost no injury by the working of the machine. The Committee again inspected the field on the 22nd of June, when they found that the weeds had been very thoroughly eradicated from that portion of the field on which the machine had been employed. The Committee have no hesitation in reporting that the machine invented by Mr Ingermann did its work well, and that it may be usefully employed in all cases where fields are overrun with weeds; and they recommend that the Society's medium gold medal should be awarded to Mr Ingermann.

This report was approved.

IV.—BARCLAY'S CULTIVATOR.

This implement (fig. 5) was exhibited by George Sellar & Son, Huntly, and invented by James W. Barclay, M.P., and was tried at Mr Monteith's farm, Liberton Tower Mains, on the 15th and 16th November.

Fig. .



The objects sought to be accomplished by the digger are in the case of stubble land to open and pulverise the soil more effectually to the depth required; to cut the roots of thistles and other deep-rooted weeds; to turn over the upper two or three inches of the soil so as to cover the stubble, expose the roots of weeds to the winter's frost, and to bring up and mix a portion of the subsoil with the upper mould. The effects to be produced are thus a combination of the work of the plough and the cultivator. In the case of green crop land for a seed furrow the objects are to stir and pulverise the earth, without exposing the dung or leaving

the soil so open as after the ordinary plough, and in the case of both stubble and clean land, to avoid the packing of the subsoil and consequent separation from the upper soil caused by the horses' feet on the furrow and by the sole of the plough. The digger was first tried in a stubble field, making two furrows nine inches deep. The average draught was about 6 cwt. The Committee recommended the Directors to award the silver medal.

The Board approved of the award.

V.—POTATO PLANTERS.

The Potato Planters selected at the Glasgow Show 1875 were tried at Liberton Mains, 4th April 1876. The trial had been arranged to take place on a field at Powburn belonging to Mr Bryden Monteith, but owing to Mr Monteith's unavoidable absence the arrangements had not been completed, and the Society, after making a commencement there, was very much indebted to Mr Black, Liberton Mains, who most kindly offered to have the trial on a field which he was planting, and to furnish seed, horses and everything that was required. Six machines appeared on the ground, exhibited by—1. William Dewar, Kellas, Dundee; 2. Alexander Guthrie, Craigo, Montrose; 3. Charles Hay, North Merchiston, Edinburgh; 4. G. W. Murray & Co., Banff (Ferguson's patent); 5 and 6. J. W. Robinson & Co., Liverpool (Aspinwall's patent). The Committee are glad to report generally that the machines were greatly improved since the trial in October last; and, with the exception of Aspinwall's machine, which appeared for the first time, they attribute that improvement very much to the trial formerly held. They believe that all the machines would have done their work well with whole seed riddled to one size; but on this occasion they were put to a thorough test, being tried with seeds of all sizes, both cut and uncut. One of Aspinwall's patent machines being adapted solely for planting potatoes on the flat, not usually done in Scotland, and being of the same principle in the delivery of the seed as his other machine, it was not tried. After a thorough trial your committee selected three machines—viz., Mr Guthrie's, price L.14; Messrs Murray & Co.'s, L.18, 18s.; Aspinwall's patent, L.12—and again subjected them to a further trial, each machine being drawn by the same horse. Messrs Guthrie and Murray & Co.'s machines are adapted to plant two drills, and are on much the same principle, the seed being raised from a hopper in cups, and dropped into the drill. Both machines are simple in construction, and not likely to go out of order, and appeared to be of much the same draught—Messrs Murray's having this objection, that the horse and the wheels of the machine travel on the tops of the drills, which

breaks down the drills, and makes the labour of the horse more severe. Aspinwall's patent plants only one drill, but is very light in draught; by a very ingenious invention the potato-seed is picked up by a series of steel needles fixed on a revolving disc, which lift it from the hopper and drop it in the bottom of the drill. It is simple in construction, and appears unlikely to be easily put out of order. Your Committee do not consider that any of these machines are thoroughly perfect, but at the same time the improvement is so marked, and the work really so fairly done, that they deem it right to recommend the Directors to award two prizes of, say, L.10 each to one of the double-drill machines constructed on the cup principle, and to the single-drill machine constructed on the needle principle. Your Committee had considerable difficulty in deciding which of the two machines on the cup principle was the best, but came to the conclusion that, taking the difference in price of the machine and everything else into consideration, they were justified in giving the preference to Mr Guthrie's machine. They would therefore recommend to the Directors to award a L.10 prize to Mr Alexander Guthrie, Craigo, Montrose, for double-drill potato-planter on the cup principle, and a similar prize of L.10 to Messrs J. W. Robertson & Co., Liverpool, for Aspinwall's patent single-drill potato-planter on the needle principle.

The following letter on the subject was then read:—

BANFF FOUNDRY, N.B., 10th April 1876.

Dear Sir,—I have read with much interest the account of the trial of potato planters held at Liberton, under the auspices of your Society, as given in the *Scotsman* and *North British Agriculturist*, and as I observe the decision has to be confirmed by your Directors, I take the liberty of officially addressing you, not with a view of pronouncing dissatisfaction with the judgment, but in order to direct the attention of your board of practical agriculturists to some points of great importance, which I consider your judges will even agree with me in saying are worth reconsideration. From the accounts given in the papers named, I learn that the machine forwarded by my firm did as good work as any, and was only thrown out because the horse had to walk and the wheels to run on the top of the drills. The first thing I would respectfully ask your board to consider is, should a potato-planter run in the bottom of the furrow or on the drill-top? Personally I was so satisfied that it should run on the top that I incurred an extra expense of L.3, 3s. in the price of the machine to secure this; and can at once supply the same machine to run in the furrows at L.3, 3s. less money. But a furrow-running machine, when farmyard dung is used, which is the case in four instances out of five, has this disadvantage, that the dung is very much displaced by the horse's feet, and the wheels clogging and collecting it in hillocks, leaving parts without and parts with excess of dung, so that the plough following cannot properly cover the same. This displacement of the dung also tends to displace the seed, even to such an extent as many remain exposed to the ravages of the crows. On the other hand, when farmyard dung is used, and the horse made to walk and the wheels to run on the tops of the drills, the dung is left even and undisturbed, and from its open nature tends to prevent the seed from rolling when it falls. Our machine was specially made for this class of work, and, through no dung

being used at the trial, the seeds in our case had so much further to fall which would tend to make them roll and lie over irregular. The only drawback to the horse and machine on the top of the drills is a little extra draught, but this a mere trifle, as the draught is below 2 cwt., which is nothing to touch any horse. I am quite aware of the disadvantages that judges are placed at in seeing a lot of new inventions tried for the first time and under one condition only—viz., without farmyard dung. This, I hope, will be considered sufficient excuse for my addressing you on the subject, and pointing out my reasons for constructing our machine in the way that it is—more so when I find that what I consider to be one of the principal points of merit is the very one that threw it out. I may add, that I have been offered £2 more for my artificial manure-sowers if I would carry out the same improvement on them. From the high standing and undoubted integrity of the gentlemen you had acting as judges, I feel sure they will never suppose that my remarks are meant to throw any reflection on what is reported to be their opinion, as I feel sure their purpose is the same as mine—trying to bring to the front the best machine for the general public, which I hold to be the one most suitable for the work under all ordinary circumstances.—Yours faithfully,

(Addressed) F. N. MENZIES, Esq.

(Signed) G. W. MURRAY.

After some discussion, it was moved that the report of the Committee be approved, and that Mr Murray be informed that the statements in his letter should have been made by his representative at the trial; which was unanimously agreed to.

VI.—POTATO LIFTERS.

The trial of the Society's lifters selected at the Aberdeen Show, 1876, took place on the 10th of October, in a field on the farm of Liberton Mains, kindly granted for the purpose by Mr Robert Black. The field was not in the most favourable condition for the trial: the ground was wet, and the potato shaws were strong and rank; but potato-lifting was being carried on in the field with the pronged plough, and it may therefore be considered as perhaps a fair average field in ordinary farm work, and the Committee give the results of the trial as they found them:—

1. *Messrs Bisset & Sons, Blairgowrie.*—This implement was exhibited at the Aberdeen Show. The mechanical contrivance by which the potatoes are unearthed does not materially differ from implements already in use. A deep-cutting broad cutter raises the plant, and a rapidly revolving wheel, with projecting arms, scatters the shaws and surrounding earth, and is supposed to throw out the tubers so as to be ready for being lifted. This operation the machine certainly performed, but the Committee did not fail to observe that a considerable number of the potatoes were fairly severed in two pieces; and when they consider how many more, without having been cut or severed, must necessarily have been bruised, they are led to the conclusion that the action

of this machine cannot be conducive to the preservation of potatoes to be stored in pits. Seeing that the mechanical arrangement is, in principle, the same as that already employed in other machines, and that the improvement in detail still leaves the machine open to the objection of injury to the tubers, to which the Committee have alluded, they do not think it can be reported to have earned a prize.

2. *Aspinwall's Patent, exhibited by Messrs J. W. Robinson & Co., Liverpool.*—These exhibitors had two implements on the ground. The first was the implement exhibited at Aberdeen, which alone, of course, is entitled to be put in competition. But, on being tried, this implement was withdrawn, as it was stated by the exhibitors that it was not applicable to damp soil and luxuriant shaws. The second implement had been made with an arrangement for a freer separation of the potatoes from the earth and shaws; but this implement, though exhibited, cannot compete, and the Committee have to report that they do not find Mr Aspinwall entitled to a premium.

The Committee take this opportunity of reporting that the raising of potatoes and separating them from the roots to which they are attached, and from the earth in which they are embedded, without injuring their skin, is an operation not without great difficulty, and it seems to them that in the implements exhibited to-day, and in all others they have seen which profess to do the work required, the speed of the revolving machinery employed in separating the potatoes from the soil is far too rapid and violent to be consistent with raising the potatoes in a state to be advantageously stored in pits.

The report was adopted.

VII.—WATER-TESTING APPARATUS.

This apparatus was exhibited at the Aberdeen Show by Messrs Joseph Davis & Co., London, and was tried by the Committee on the 28th of November. The Committee, after experimenting with several of the tests, consider that they are well known, but that they would be of comparatively little use in the hands of a person not educated in chemistry. They are of opinion that no prize should be awarded.

The Board approved of the report.

VIII.—MURRAY'S THRASHING MACHINE.

This Machine was exhibited by Messrs George W. Murray & Co., Banff, and was tried in the show-yard on the 28th of July. It was seen at work with barley and oats, and did its

work in a very satisfactory manner. The Committee added that they found that the price was moderate, and recommended that it be awarded the gold medal.

The board approved of the report.

IX.—TURNIP RAISERS.

(By Local Committee at Aberdeen.)

The local committee appointed previous to the Aberdeen Show, 1876, met at Balhaggardy, Inverurie, on Thursday the 30th of November. Present—Messrs Alex. Auld, Newton of Rothmaise, Insh; James Reith, South Auchinleck, Skene; and George Wilken, Waterside of Forbes, Alford. Messrs Robert Salmond, Nether Balfour, Durris, and Alexander Yeats, Aberdeen, were unable to be present in consequence of indisposition. The members present appointed Mr Wilken to act in Mr Salmond's absence as convener, and also, in consequence of so few of the local committee being able to be present, agreed to ask Messrs Campbell, Kinellar, and Stephen, Conglass, two of the local committee, to act as judges of the turnip-raisers along with those present. After inspecting the four machines set aside for trial, all were considered nearly the same as those exhibited at Aberdeen, and all were allowed to compete. The field was admirably adapted for the purpose, being quite free from stones, and the whole of the machines were very efficiently horsed by Mr Maitland, Balhaggardy. The turnips were a superior crop, and at least a fourth of an acre was allowed for each machine, both of swedish and yellows. There was little difference in the speed of either machine, all performing at the rate of three-fourths of an acre per hour. The work done, taken all over, was fair. The judges separated the machines into two classes.

First-class machines that topped and tailed, of which there were three entries:—

1st. James Thom, Leden Urquhart, Strathmiglo, No. 1694. This machine requires two horses, takes one drill only, throws the turnips to one side, the same as a potato-digger, and performs the work far superior to any of the others. Recommend it be awarded a silver medal.

2d. Adam T. Pringle, Edinburgh and Kelso, No. 652. This machine also requires two horses, takes two drills, lifts the turnips and leaves them on the surface, and performs the work fairly. Recommend it be awarded a medium silver medal.

3d. Duncan Ross, agricultural factor, Inverness, No. 1617. This machine also requires two horses, takes two drills, and simply tops and tails without removing them from their original position. Recommend it be awarded a minor silver medal.

Second-class machines that tailed only, of which there was only one entry:—

John Gregory, Westoe, South Shields, No. 1195. This machine requires only one horse, takes two drills, tails only, and leaves the turnips in their original position. Recommend it be awarded a medium silver medal.

The Board approved of the report, and confirmed the awards as suggested.

AGRICULTURAL STATISTICS OF SCOTLAND, 1876.

EXTRACTED FROM THE GOVERNMENT RETURNS.

TABLE I.

Population, Total Area, and Abstract of Acreage under Crops and Grass.

Counties.	Population on 3d April 1871.	Total Area in Statute Acres.	Total of Acreage under all Kinds of Crops, Bare Fallow, and Grass.	Under Corn Crops.	Under Green Crops.	Under Clover, Sanfoin, and Grasses under Rotation.	Per- manent Pasture, or Grass, not broken up in Rotation (exclusive of Heath or Mountain Land).	Per- centage of Corn Crops to Total Acreage under all kinds of Crops, Bare Fallow, and Grass.
Aberdeen . . .	244,603	1,260,625	596,863	214,333	105,400	252,264	24,243	35.9
Argyle, . . .	75,679	2,083,126	115,125	23,569	12,239	18,896	59,030	20.5
Ayr,	200,809	735,262	309,408	59,154	17,822	94,954	137,322	19.1
Banff,	62,023	439,219	166,671	62,925	29,489	65,692	8,308	37.8
Berwick, . . .	36,486	297,161	192,094	63,797	35,222	57,162	35,645	33.2
Bute,	16,977	143,997	24,502	5,783	2,994	6,391	8,883	23.6
Caithness, . .	39,992	453,708	105,884	35,698	16,759	29,390	23,800	33.6
Clackmannan,	23,747	31,876	15,884	5,840	1,535	3,279	4,914	36.8
Dumbarton, . .	58,857	172,677	46,060	9,862	4,443	12,764	18,929	21.4
Dumfries, . . .	74,508	795,946	216,130	49,975	25,669	63,762	76,459	23.1
Edinburgh, . .	328,379	234,926	133,465	38,189	21,743	31,869	41,517	28.6
Elgin or } Moray, . . }	43,612	340,000	103,698	39,974	19,976	38,667	4,964	38.5
Fife,	160,735	328,427	245,636	87,533	47,509	57,354	51,492	35.6
Forfar,	237,567	569,840	251,289	95,940	50,692	77,667	26,764	38.2
Haddington, . .	37,771	179,142	113,615	43,891	26,338	26,451	16,122	38.6
Inverness, . . .	87,531	2,723,501	122,963	40,221	19,553	26,895	35,228	32.7
Kincardine, . .	34,630	248,284	120,050	45,255	22,433	46,142	6,126	37.7
Kinross,	7,198	49,812	31,497	7,630	4,021	11,208	8,518	24.3
Kirkcubright	11,859	610,343	172,835	32,618	17,610	47,444	75,062	18.9
Lanark,	765,339	568,868	243,442	52,151	18,441	72,016	100,217	21.4
Linlithgow, . .	40,965	81,114	58,378	18,205	7,226	13,866	18,800	31.2
Nairn,	10,225	137,500	26,070	9,614	4,856	9,973	1,586	36.9
Orkney, and Shetland, . . .	31,274 } 31,698 }	598,726 }	96,270 }	35,801 }	16,301 }	24,018 }	19,146 }	37.2 }
Peables,	12,330	227,869	41,772	10,979	6,599	13,675	10,480	26.3
Perth,	127,768	1,661,690	336,924	106,006	59,393	99,100	79,343	31.5
Renfrew,	216,947	162,428	92,994	18,187	7,360	18,556	48,582	19.6
Ross and } Cromarty, }	80,955 }	2,016,375 }	124,826 }	47,413 }	27,259 }	29,987 }	19,395 }	38.0 }
Roxburgh, . . .	53,974	428,494	174,525	51,077	29,445	56,139	37,507	29.3
Selkirk,	14,005	166,524	22,749	5,325	3,454	7,676	6,236	23.4
Stirling,	98,218	298,579	110,788	30,655	9,503	24,036	45,009	27.7
Sutherland, . .	24,317	1,207,188	28,346	10,383	5,058	6,691	6,018	36.9
Wigtown,	38,830	327,906	145,427	38,762	19,064	48,379	38,697	26.7
TOTAL,	3,360,018	19,496,132	4,637,893	1,407,515	689,974	1,393,011	1,129,369	30.3

TABLE II.

Total and Proportionate Number of Live Stock, as Returned upon the 25th of June 1876.

Counties.	Horses.		Cattle.		Sheep.		Pigs.	
	Number used solely for Agriculture, &c., as Returned by Occupiers of Land.	Proportionate Number to every 100 Acres under Crops, Bare Fallow, and Grass.	Total Number Returned.	Proportionate Number to every 100 Acres under Crops, Bare Fallow, and Grass.	Total Number Returned.	Proportionate Number to every 100 Acres under Crops, Bare Fallow, and Grass.	Total Number Returned.	Proportionate Number to every 100 Acres under Crops, Bare Fallow, and Grass.
Aberdeen, . .	25,192	4·2	167,904	28·1	155,773	26·1	9,500	1·6
Argyle, . . .	7,142	6·2	60,725	52·7	1,015,470	882·1	4,934	4·3
Ayr,	8,462	2·7	87,780	28·4	359,103	116·1	15,271	4·9
Banff,	7,661	4·6	45,659	27·4	52,474	31·5	3,931	2·4
Berwick, . . .	5,257	2·7	15,039	7·8	266,873	138·9	4,038	2·1
Bute,	1,047	4·3	7,805	31·9	41,738	170·3	751	3·1
Caithness, . .	5,136	4·9	21,504	20·3	96,423	91·1	1,943	1·8
Clackmannan, .	703	4·4	3,839	24·2	10,940	68·8	1,852	11·7
Dumbarton, . .	1,717	3·7	13,153	28·6	71,202	154·6	911	2·0
Dumfries, . . .	7,390	3·4	53,778	24·9	493,020	228·1	14,413	6·7
Edinburgh, . .	4,205	3·2	18,661	14·0	168,565	126·3	5,158	3·9
Elgin or } Moray,	4,873	4·7	24,870	24·0	56,393	54·4	3,449	3·3
Fife,	10,222	4·2	38,875	15·8	69,150	28·2	6,463	2·6
Forfar,	10,069	4·0	48,701	19·4	127,654	50·8	6,453	2·6
Haddington, . .	3,727	3·3	7,072	6·2	108,447	95·5	2,790	2·5
Inverness, . .	9,008	7·2	53,242	43·3	724,518	589·2	4,127	3·4
Kincardine, . .	4,748	4·0	23,504	23·7	32,176	26·8	2,523	2·1
Kinross,	1,011	3·2	6,133	19·5	23,155	73·7	597	1·9
Kirkcubright	5,366	3·1	41,229	23·9	369,334	213·7	7,444	4·3
Lanark,	7,522	3·1	65,147	26·8	213,535	87·7	8,268	3·4
Linlithgow, . .	2,140	3·7	10,902	18·7	19,906	34·0	1,858	3·2
Nairn,	1,220	4·7	6,443	24·7	15,089	57·9	820	3·1
Orkney and	5,697	5·9	26,156	27·2	30,048	31·2	4,687	4·9
Shetland, . . .	5,772	11·1	21,050	40·6	87,925	169·7	4,663	9·0
Peebles,	1,153	2·8	6,495	15·5	196,720	470·9	974	2·3
Perth,	13,764	4·1	80,024	23·8	659,210	195·7	9,597	2·8
Renfrew,	3,128	3·4	25,090	27·0	32,909	35·4	1,917	2·1
Ross and } Cromarty, . . .	7,099	5·7	41,609	33·3	362,980	290·8	6,535	5·2
Roxburgh, . . .	4,588	2·6	16,763	9·6	489,357	280·4	3,960	2·3
Selkirk,	568	2·5	2,572	11·3	162,719	715·3	447	2·0
Stirling,	4,801	4·3	30,225	27·3	115,610	104·4	2,297	2·1
Sutherland, . .	2,573	9·1	13,057	46·0	228,503	806·1	1,239	4·4
Wigtown,	5,707	3·9	41,081	28·2	132,791	91·3	10,289	7·1
TOTAL,	188,668	4·1	1,131,087	24·4	6,989,719	150·9	154,099	3·3

APPENDIX (A)

PROCEEDINGS AT BOARD MEETINGS.

MEETING OF DIRECTORS, 2d FEBRUARY 1876.

Present—The Hon. G. R. Vernon; Admiral Sir William J. Hope Johnstone, K.C.B.; Professor Balfour; Mr Ferguson, Kinnochtry; Mr Findlay of Springhill; Mr Gillon of Wallhouse; Mr Hutchison of Carlowie; Colonel Innes of Learney; Mr Irvine of Drum; Mr John Ord Mackenzie of Dolphinton; Mr Mackenzie of Portmore; Mr Munro, Fairnington; Mr Murray of Dollerie; Mr Monteith, Liberton Tower Mains; Mr Smith, Stevenson Mains; Mr Swinton, Holy Bank; Captain Tod of Howden; Mr Pettigrew Wilson of Polquhairn; Professor Wilson—Mr Munro, Fairnington, in the chair. Mr F. N. MENZIES reported apologies for the absence of Sir William Forbes of Craigievar, Bart.; Sir George Macpherson Grant of Ballindallock, Bart.; Mr Copland, Mill of Ardlethen; Mr Howatson of Dornel; Mr Hunter of Thurston; Mr Johnstone of Bodesbeck; Mr Kenneth Mackenzie, C.A.; Mr Martin, jr. of Auchendennan; and Mr Walker of Bowland.

GLASGOW SHOW, 1875.—Letters were submitted from the Earl of Glasgow, the Lord Provost of Glasgow, Sir Michael Shaw Stewart, Mr Graham Somervell (convener of Ayrshire), and from Mr Bowden Fullarton (convener of Bute), acknowledging the votes of thanks passed at last general meeting.

ABERDEEN SHOW, 1876.—The SECRETARY stated that the competition for the premium of £50 offered by the Society for the best thoroughbred stallion to serve in the district of the Aberdeen show during the ensuing season was fixed to take place at Aberdeen on Friday the 4th current—all entries being made with Mr Alexander Yeats, Secretary of the Royal Northern Society, 89 Union Street, Aberdeen, on or before the morning of the competition.

FOOT-AND-MOUTH DISEASE.—A letter was submitted from Mr C. Eardley Wilnot, of the Veterinary Department of the Privy Council, acknowledging receipt of the memorial to the Lords of the Council adopted at the general meeting on the 19th of January, and stating that it will be submitted to their Lordships.

CHEMICAL DEPARTMENT.—The Board took into consideration the resolution of the general meeting with reference to the appointment of a chemist, and the arrangements for carrying out the agricultural stations, when, after some discussion, the whole matter was remitted to the Chemical Committee.

PHILADELPHIA EXHIBITION, 1876.—The SECRETARY stated that the regulations for the International Exhibition at Philadelphia could be seen on application at the Society's chambers, No. 3 George IV. Bridge, Edinburgh; that the live stock display will be held as follows:—Horses, mules, and asses, from 1st to 15th September; cattle, from 29th September to 5th October; sheep, swine, goats, and dogs, from 10th to 25th October; and poultry, from 28th October to 10th November; and that forms of entry will be furnished on application to Mr B. T. Brandreth Gibbs, 5 Craig's Court, Charing Cross, S.W.

MEETING OF DIRECTORS, 1st MARCH 1876.

Present—Admiral Sir William J. Hope Johnstone, K.C.B.; Professor Balfour; Mr Gillon of Wallhouse; Mr Irvine of Drum; Mr Mackenzie of Portmore; Mr Munro, Fairnington; Mr Swinton, Holy Bank; Mr Pettigrew Wilson of Polquhairn; and Professor Wilson. Mr F. N. MENZIES reported apologies for the absence of Sir Alexander Jardine of Applegarth, Bart.; Mr Copland, Mill of Ardlethen; Mr Hunter of Thurston; Mr Johnstone of Bodesbeck; Mr Smith, Stevenson Mains; and Mr Walker of Bowland; but in consequence of there not being a quorum of Directors present, the meeting was adjourned till Wednesday next, the 8th instant.

[ADJOURNED MEETING OF DIRECTORS, 8TH MARCH 1876.]

Present—Mr Copland, Mill of Ardlethen; Mr Gillon of Wallhouse; Mr Hutchison of Carlowie; Mr Irvine of Drum; Mr Mackenzie of Portmore; Mr Smith, Stevenson Mains; Mr Stewart of Ingliston; Mr Swinton, Holyn Bank; Mr Pettigrew Wilson of Polquhairn.—Mr Mackenzie of Portmore in the chair. Mr F. N. MENZIES reported apologies for the absence of Mr Graham Binny, W.S.; Mr Hunter of Thurston; Mr Kenneth Mackenzie, C.A.; Mr Martin, yr. of Auchendennan; Mr Munro, Fairnington; and Mr Walker of Bowland.

CHEMICAL DEPARTMENT.—At the meeting of the Board on the 2d of February it was reported that Sir Thomas Buchan Hepburn had resigned the chairmanship of the Committee in charge of the Chemical Department, when the Directors unanimously resolved to request Sir Thomas to withdraw his resignation, and in the event of his declining to do so, Mr Mackenzie of Portmore was requested and agreed to act. At a meeting of Committee held on 23d February, it was stated that Sir Thomas adhered to his resignation. The minute of that meeting bore that the Committee could not commence their report without expressing their regret at the loss of the valuable services of Sir Thomas Hepburn, who took so lively an interest in the Chemical Department, and who had for many years devoted so much time to the duties devolving upon him—first as a member, and latterly as convener of the Committee. The minute also stated that, after the reading of the remit to the Committee, a prolonged discussion ensued as to the course of action which should now be taken with reference to the instructions of the last general meeting of the Society, and it was ultimately unanimously resolved that the best manner of carrying out those instructions is, in the first place, to advertise that a chemist is required by the Society to organise and conduct the experimental stations about to be established, and who shall devote his whole time to the service of the Society; and that if the Directors are able to secure the services of a competent chemist on the terms proposed, they can then in concert with him arrange a plan of action in accordance with the report of the Directors to the general meeting in June last, which was then agreed to by the Society in all points regarding the establishment of the stations. The Secretary was accordingly instructed to prepare an advertisement to chemists in general terms, and also a statement to be printed and shown to intending candidates, containing the salary and duties, and in accordance with the above-mentioned report of June last as modified at the last general meeting. The Board approved of the minute, and the Secretary was instructed to send to Sir Thomas Hepburn an excerpt from it, with reference to the loss of his very valuable services.

ABERDEEN SHOW.—*Thoroughbred Stallions.*—The report of the competition for the L.50 prize offered by the Society for the best thoroughbred stallion to serve this season in the district of the show was submitted, from which it appeared that the competition took place at Aberdeen on 4th February; that seven animals had been entered; and that the judges—Captain Carnegie of Lour, and Colonel Innes of Learney—had awarded the premium to Mr Thomas Bland, Greystone, Alford, Aberdeenshire, for his bay stallion “Blucher.”

Showyard.—Letters were submitted from Mr William Gordon, Town Clerk, Aberdeen, intimating that the Town Council had granted permission to the Society to use a portion of the links, extending to about twenty acres, for the show to be held from the 25th to the 28th of July, both inclusive; and that the Water Committee had resolved to give a supply of water free of charge—both privileges being subject to the usual conditions.

Stock at Birmingham Show.—A letter was read from Mr H. M. Jenkins, Secretary of the Royal Agricultural Society of England, stating that, at the meeting of the Council of that Society held on Wednesday the 1st inst., the following resolution had been carried unanimously:—“That the exhibitors of stock at the Birmingham meeting be allowed to remove such animals belonging to them as have been entered for the Highland Society’s Show at Aberdeen at four o’clock on the afternoon of Monday, July 24, on furnishing to the stewards satisfactory proof of such entry for the Aberdeen Show.” Mr Menzies was instructed to inform Mr Jenkins that no alteration can now be made in the Aberdeen arrangements, and to request that the stock referred to may be allowed to leave the yard on Saturday evening.

AGRICULTURAL AND FORESTRY EXAMINATIONS.—It was intimated that the examinations for the Society’s agricultural certificates and diploma, and for the certificates in forestry, had been fixed for Tuesday and Wednesday the 21st and 22d current, candidates being required to lodge intimation, on or before the 10th, with the Secretary, from whom further information may be obtained.

PHILADELPHIA EXHIBITION.—A letter was read from Mr B. T. Brandreth Gibbs, 5 Craig’s Court, Charing Cross, S.W., stating that the entries for the Philadelphia Exhibition referred to at last board meeting should be made soon, as it was necessary to let the authorities in America know before 1st May what to expect from this country.

MEETING OF DIRECTORS, 5TH APRIL 1876.

Present—Professor Balfour; Mr Hutchison of Carlowrie; Mr Munro, Fairnington; Mr Smith, Stevenson Mains; Mr David Stevenson, C.E.; Mr Swinton, Holyn Bank; Captain Tod of Howden; and Mr Walker of Bowland. Mr F. N. MENZIES reported apologies for the absence of Sir Alexander Jardine of Applegarth, Bart.; Sir George Macpherson Grant of Ballindalloch, Bart.; Mr Cochrane, Little Haddo; Mr Copland, Mill of Ardlethen; Mr Gillon of Wallhouse; Mr Hunter of Thurston; Colonel Innes of Learney; Mr Irvine of Drum; Mr Johnstone of Bolesbeck; Mr Mackenzie of Portmore; Mr Martin, yr. of Auchendennan; Mr Oswald of Dunnikier; Professor Wilson; and Mr Pettigrew Wilson of Polquhain. As there was not a quorum of Directors present, the meeting was adjourned till Wednesday the 12th current.

ADJOURNED MEETING OF DIRECTORS, 12TH APRIL 1876.

Present—Admiral Sir Wm. J. Hope Johnstone, K.C.B.; Mr Ferguson, Kinnochtry; Mr Hutchison of Carlowrie; Mr Murray of Dollerie; Mr David Stevenson, C.E.; Mr Stewart of Ingliston; Mr Swinton, Holyn Bank; Mr Walker of Bowland; Mr Pettigrew Wilson of Polquhain—Mr Swinton, Holyn Bank, in the chair. Mr F. N. MENZIES reported apologies for the absence of Mr Graham Binny, W.S.; Mr Copland, Mill of Ardlethen; Mr Kenneth Mackenzie, C.A.; and Mr Munro, Fairnington.

AGRICULTURAL EDUCATION.—The report of the annual examination of candidates for the diploma and certificates in agriculture, which took place on the 21st and 22d March, was submitted, from which it appeared that sixteen gentlemen enrolled their names, that fifteen presented themselves, and that the examinations resulted in the following passing:—

For Diploma.—Mr R. Lang Anderson, Milliken Park, Renfrewshire; Mr Archibald A. Ferguson, Gosfield, Essex; Mr John Arthur Macdonald, Rathmore, Aghnaccliffe, County Longford; Mr Alexander Sutherland, Ramyards, Watten, Golspie.

For First-Class Certificate.—Mr Cecil C. Baker, 2 Bloomsbury Place, London; Mr Robert Carr, Felkington, Norham; Mr Percy H. Cathcart, 16 Oakley Square, London; Mr John M. Caig, Killbilt, Stranraer; Mr C. E. M. Russell, Ballielisk, Dollar.

For Second-Class Certificate.—Mr Andrew Catton, Conston, Aberlour, Fife; Mr John Fleming, Coates, Penicuik; Mr John J. Sharp, Leaston, Upper Keith.

Prizes in Agricultural Class.—A letter was read from Professor Wilson intimating that, at a special examination for the Society's prizes held on the 31st ultimo, for which there were fourteen candidates, the prizes were awarded as follow:—1st prize of L.6 in books, to Mr Alexander Sutherland, Ramyards, Watten, Golspie; 2d prize of L.4 in books, to Mr John Fleming, Coates, Penicuik.

CHEMICAL DEPARTMENT.—The following letter from Sir Thomas Buchan Hepburn, Bart., was read:—

“SMEATON HEPBURN, PRESTONKIRK, N.B.,

“10th March 1876.

“My dear Menzies,—I have received your letter of the 8th, with excerpt from minute of Committee in charge of the Chemical Department. Will you be so good as to express my grateful thanks to the Committee for their much-esteemed expression of their opinion of my services during my connection with the Committee, and to the Board of Directors for their cordial approval of it. I feel the more gratified by it as it was quite unexpected. I beg to assure them that it was with the greatest regret that I felt myself compelled to resign. Yours truly,

(Signed) “THOMAS B. HEPBURN.

“F. N. Menzies, Esq.”

The applications for the office of chemist, together with various letters on the subject, were remitted to the Committee in charge of the Chemical Department, with instructions to report and recommend if they see fit.

VETERINARY EXAMINATIONS. The SECRETARY intimated that the annual public examination of candidates for the Society's veterinary certificate, which is open to the students of any veterinary teacher duly recognised by Government, would be held in the Society's Hall on Tuesday and Wednesday, the 18th and 19th current; and that the practical examination would take place in Mr Buist's auction mart, Lauriston, on Monday the 17th.

ABERDEEN SHOW, 1876.—*Committee of Superintendence.*—Letters to the conveners of the counties connected with the show, and to the Lord Provost of Aberdeen in regard to the nomination of the local committee, were submitted and approved.

EDINBURGH SHOW, 1877.—The Board approved of letters being addressed to the conveners of the counties in the district of the Edinburgh Show in regard to the auxiliary subscription.

PRESENTATION OF BAROMETER.—A letter was submitted from Messrs Joseph, Davis, & Co., 90 and 92 Crampton Street, Newington Butts, London, presenting to the Society one of their royal polytechnic barometers, in which is incorporated Admiral Fitzroy's barometer, for use at the Society's hall.

The Directors instructed the Secretary to return their best thanks to Messrs Joseph, Davis, & Co. for their valuable gift, and to place the barometer in the library.

MEETING OF DIRECTORS, 3d MAY 1876.

Present—Sir Alexander Jardine of Applegarth, Bart.; Admiral Sir William J. Hope Johnstone, K.C.B.; Mr Graham Binny, W.S.; Mr Copland, Mill of Ardllethen; Mr Hunter of Thurston, Mr Hutchison of Carlowrie, Mr Johnstone of Bodesbeck; Mr Bryden Monteith, Liberton Tower Mains; Mr Munro, Fairnington; Captain Tod of Howden; Mr Walker of Bowland; Professor Wilson—Mr Munro, Fairnington, in the chair. Mr F. N. MENZIES reported apologies for the absence of Mr Ferguson, Kinnochrty; Mr Gillon of Wallhouse; Mr Howatson of Dornel; Mr Irvine of Drum; Mr Kenneth Mackenzie, C.A.; Mr Murray of Dollerie; Mr David Stevenson, C.E.; and Mr Swinton, Holyn Bank.

GENERAL MEETING.—The half-yearly general meeting of the Society, for the election of members and for other business, was fixed to be held on the 14th of June, being the first Wednesday after the closing of the entries for the Aberdeen Show.

VETERINARY DEPARTMENT.—The report of the examinations for the Society's veterinary certificate on the 17th, 18th, and 19th April was submitted, from which it appeared that twenty students presented themselves for examination, and that fourteen passed. The two medium gold medals given to the students who passed the best practical and the best general examination were awarded as follow:—*Best Practical Examination.*—Robert Rain, Castle-Douglas. *Best General Examination.*—John M'Fadyean, Barrachan, Newton-Stewart.

MEETING OF DIRECTORS, 7TH JUNE 1876.

Present—Mr Graham Binny, W.S.; Mr Dove, Eastfield; Mr Findlay of Springhill; Mr Findlay of Easterhill; Mr Gillon of Wallhouse; Mr Hunter of Thurston; Mr Hutchison of Carlowrie; Mr Irvine of Drum; Mr Mackenzie of Portmore; Mr Munro, Fairnington; Mr Murray of Dollerie; Mr Smith, Stevenson Mains; Mr David Stevenson, C.E.; Mr Swinton, Holyn Bank; Captain Tod of Howden; Mr Walker of Bowland; Mr Pettigrew Wilson of Polquhain; Professor Wilson—Mr Munro, Fairnington, in the chair. Mr F. N. MENZIES reported apologies for the absence of Sir Alexander Jardine of Applegarth, Bart.; Sir George Macpherson Grant of Ballindalloch, Bart.; Admiral Sir Wm. J. Hope Johnstone, K.C.B.; Mr Copland, Mill of Ardllethen; Mr Howatson of Dornel; Colonel Innes of Learney; Mr Johnstone of Bodesbeck; Mr Kenneth Mackenzie, C.A.; and Mr Martin, yr. of Auchendennis.

GENERAL MEETING.—The programme of business for the half-yearly general meeting on the 14th current was arranged as follows:—Election of members; arrangements for Aberdeen and Edinburgh Shows; report of examinations for agricultural certificates and diploma; report by Directors on the Chemical Department; petition by Professor Blackie in regard to Celtic Chair; report of examinations for veterinary certificate, and deputation to the Lord President of the Privy Council in regard to veterinary charter to be reported: Volume VIII. (new series) of the Society's Transactions.

NEW MEMBERS.—The list of candidates for election at the general meeting was submitted, and the SECRETARY mentioned that he could, in terms of the bye-laws, receive additional names up to the morning of the 14th.

VETERINARY CHARTER.—Captain TOD of Howden, Chairman of the Veterinary Committee, reported that on the 24th of May a deputation from the Society waited on the Lord President of the Privy Council, for the purpose of asking that a charter should be granted to the Society, by which their powers of granting certificates might be extended for that of diplomas. Captain Tod added that the Earl of Dalkeith introduced the deputation, and after various remarks by several members the Duke of Richmond aid the memorial should receive his earnest consideration.

CHEMICAL DEPARTMENT.—In consequence of a remit from the last general meeting regarding the appointment of a chemist, the Directors, on the 2d of February, referred the matter to the Committee in charge of the Chemical Department. The Committee reported that the best means of carrying out the instructions of the general meeting was to advertise for a chemist qualified to organise and conduct the agricultural experimental stations about to be established, and who should devote his whole time to the Society. This course was approved of by the Directors, who issued advertisements, in

answer to which ten applications, besides various letters, were received. These were carefully gone over by the Committee, who reported that they had considered all the applications and relative documents, and had come to the conclusion that none of the applicants combine all the qualifications necessary for the post of chemist to the Society. They considered, however, that some of the gentlemen who had applied are possessed in a considerable degree of those qualifications. Under these circumstances the Committee could not recommend the Directors to appoint any of the gentlemen who had made application. The Committee also considered the letters received on the subject, and which were included in the remit to them; and they were of opinion, if the restriction in regard to the entire services of the chemist being devoted to the Society were removed, that much more eligible candidates would be induced to come forward. The Committee also drew the attention of the Directors to the question of the absence of laboratory accommodation, which is a serious complication in the matter.

The Directors approved of the minute, and resolved to report in terms of it to the general meeting on the 14th.

ABERDEEN SHOW.—The SECRETARY stated that he was to attend at the Imperial Hotel¹ Aberdeen, on Friday the 9th current, to receive entries and close the list.

HUNGARIAN METHOD OF MAKING HAY.—Letters were submitted from Mr Dudgeon of Cargen, sending sample of hay made on the Hungarian method. Mr Dudgeon states that the grass was put into a pit six feet deep, quite wet, on the day it was cut, covered up to a depth of 18 inches with earth. The pit was opened in the beginning of May, after having been enclosed for eleven months. He adds that the process appeared perfectly successful, and though involving a little more expense, it was worthy of consideration, in a wet season, whether it would not be worth while securing at least a part of the crop in this manner. The sample was shown to the Directors, and can be seen at No. 3 George IV. Bridge by any member who wishes to do so. Mr MENZIES stated that he had taken some of the hay home, and found that horses and cattle ate it readily.

MEETING OF DIRECTORS, 14TH JUNE 1876.

Present—Sir Alexander Jardine of Applegarth, Bart.; Admiral Sir William J. Hope Johnstone, K.C.B.; Mr Gillon of Wallhouse; Mr Milne Home of Wedderburn; Mr Hunter of Thurston; Mr Irvine of Drum; Mr Mackenzie of Portmore; Mr Kenneth Mackenzie, C.A.; Mr Munro, Fairnington; Mr Oswald of Dunnikier; Mr Stewart of Ingliston; Mr Swinton, Holyn Bank; Mr Pettigrew Wilson of Polquhain; Professor Wilson; Mr Wilson, Durn; Mr Munro in the chair. Apologies were reported for the absence of Mr Graham Binny, W.S., and Mr Walker of Bowland.

The business had reference principally to the subjects to be brought before the general meeting of this date.

MEETING OF DIRECTORS, 1ST NOVEMBER 1876.

Present—Sir Alexander Jardine of Applegarth, Bart.; Admiral Sir William J. Hope Johnstone, K.C.B.; Mr Dundas of Arniston; Mr Ferguson, Kinnochtry; Mr Gillon of Wallhouse; Mr Howatson of Dornell; Mr Hunter of Thurston; Mr Irvine of Drum; Mr John Ord Mackenzie of Dolphinton; Mr Kenneth Mackenzie, C.A.; Mr David Stevenson, C.E.; Captain Tod of Howden; Mr Pettigrew Wilson of Polquhain; Professor Wilson—Mr Pettigrew Wilson of Polquhain, in the chair. Mr F. N. MENZIES reported apologies for the absence of the Hon. G. R. Vernon, Auchans House; Sir George Macpherson Grant of Ballindalloch, Bart.; Mr Graham Binny, W.S.; Mr Cochrane, Little Haddo; Mr Dove, Eastfield; Mr Hutcheson of Carlowrie; Mr Mackenzie of Portmore; Mr Martin, yr. of Auchendennen; Mr Murray of Dollerie; Mr Swinton, Holyn Bank; Mr Walker of Bowland.

Before proceeding to the business on the programme the following resolutions were unanimously passed:—

THE LATE MARQUIS OF TWEEDDALE.—“That the Directors of the Highland and Agricultural Society of Scotland desire to express the deep and sincere regret with which they have received the information of the death of their late President, the Most Noble the Marquis of Tweeddale, K.T., G.C.B. That the Society having in the minutes of the general meeting held on the 15th of January 1873, recorded, upon his Lordship's retiring from the office of President, their sense of the great importance of the assistance which he had rendered to the Society by his presence and services at many general shows of the Society, and at numerous public meetings, for reports on various subjects, and for the zeal and ability with which he had uniformly promoted the efficiency and prosperity of the Society, it only remains for the Directors to deplore the loss they, the

Society, and the nation have now suffered by the death of one who had been for sixty-eight years connected with the Society, and who had rendered so many eminent services to his country, both as a soldier and an agriculturist."

THE LATE SIR JAMES HORN BURNETT, BART.—"That the death of Sir James Horn Burnett of Leys, Bart., having been communicated to the Directors of the Highland and Agricultural Society of Scotland, they resolved to record their sincere regret for his loss, and their sense of the obligations which the Society owed to him, both as an ordinary and extraordinary director."

THE LATE MR BAIRD OF AUCHMEDDEN.—"That the intimation of the death of Mr James Baird of Auchmedden, having been made to the Directors of the Highland and Agricultural Society of Scotland, they resolved to express their sorrow for his loss, and their sense of his services as a member and a director of the Society."

THE LATE MR GIBSON, WOOLMET.—"That the Directors of the Highland and Agricultural Society of Scotland have to record their sense of the severe loss occasioned to the Society by the death of Mr John Gibson, Woolmet, one of their number. That the Society having at the general meeting on the 17th of January 1872 expressed, on Mr Gibson's resignation of the office of Chairman of the Machinery Committee, the sense they entertained of the zealous discharge of his duties on the occasion of the general shows since 1864, the Directors have only now to lament the loss they have sustained by the removal of one who took the deepest interest in the Society, and whose presence at their meetings was of great benefit to it."

That these resolutions be engrossed in the minutes of the Society, and that the Secretary be instructed to transmit a copy of them respectively to the Marquis of Tweeddale; Lady Burnett of Leys; Mrs Baird of Auchmedden; and Mr Andrew Gibson.

CELTIC CHAIR.—At the general meeting in June last a petition having been read from Professor Blackie urging the claims of the Celtic Chair, it was agreed that, in respect the encouragement of Celtic literature was one of the original objects of the Society, the Directors should be empowered, if they found that the Society could spare the funds, to contribute 100 guineas towards the scheme in question, such subscription to be paid at once, or in a series of instalments, as might be deemed most expedient. On the recommendation of the Finance Committee, the Board agreed to pay the subscription in one sum, and that it should be included in the current year's account.

CHEMICAL DEPARTMENT.—The resolution of the last general meeting approving of the report of the Directors, and agreeing to rescind the restrictions imposed at the general meeting in January in regard to the services of the chemist to be appointed being entirely devoted to the Society, and various letters on the subject, were remitted to the Committee in charge of the Chemical Department.

VETERINARY DEPARTMENT.—The SECRETARY reported that the preliminary examination of students for the Society's veterinary certificate took place on the 11th and 12th July, when forty-one students entered their names for examination, and twenty-seven passed.

AGRICULTURAL EDUCATION.—The examination of candidates for the Society's bursaries was held on the 27th October, when Mr Robert Lyall, Catchery Watten, Caithness; and Mr William Reekie, Walton, Fife, passed for a bursary of L.20 each; and Mr D. G. Braidwood, Parduvine, Mid-Lothian, for one of L.10. The bursaries are tenable for one year. By the regulations Messrs Lyall and Reekie require to take the classes in the Edinburgh University necessary to qualify for the Society's certificate or diploma, and Mr Braidwood's bursary is given on the understanding that he continues his studies and qualifies for examination next year. The examinations were conducted by Professor Wilson, Professor Balfour, and Dr William Stirling. The Board approved of the report.

GLASGOW SHOW, 1875—*Shorthorn Cows.*—The third premium awarded to Mr Hutchinson, Manor House, for "Dairy Girl," has been forfeited, the animal having failed to produce a calf within the specified period. The premium has been transferred to Mr Beattie, Newbie House, for "Cherry Queen."

Two-year-old Shorthorn Heifers.—The second and third premiums, awarded respectively to Mr Tweedie, Deuchrie, for "Red Tulip," and to Mr Marr, Upper Mill, for "Mary Anne 10th," have been forfeited, the animals not having calved within the prescribed time. The second premium has been awarded to Mr Law, New Keig, for "Dorothy."

Two-year-old Polled Heifers.—The second and third premiums, awarded respectively to Sir George Macpherson Grant, Bart., for "Ethel" (1415), and to the Earl of Fife for "Pluscarden" (1937), have been forfeited, the animals having failed to conform to the rules as to calving. The second premium has been transferred to the Earl of Fife for "Edith."

Mares in Foal.—The first and fourth premiums, awarded respectively to Mr Gardner, Boghead, for "Jess," and to Mr Lang, Garneyland, for "Nancy," have been forfeited, the animals not having proved in foal. The first premium has been transferred to Mr Suter, Collie; the second to Mr Clarke, Spindlehowe; and the third to Mr Murdoch, Hilton.

ABERDEEN SHOW, 1876.—*Awards.*—The Directors approved of the awards at the late

show at Aberdeen, and the Chairman was authorised to sign orders for the money premiums, which the Secretary was instructed to issue, along with the medals, as early as convenient.

Supply of Forage.—The SECRETARY was instructed to compliment Mr Williamson, Standingstones, Dyce, for the admirable manner in which he, as the contractor on the occasion, carried out the supply of the forage, which was all of excellent quality.

EDINBURGH SHOW, 1877.—It was remitted to the Committee on General Shows to arrange the premiums and adjust the regulations for the show to be held at Edinburgh next year.

PROPOSED SHOW AT DUMFRIES IN 1878.—Requisitions for a show to be held at Dumfries in 1878, signed by proprietors, farmers, and others connected with Dumfriesshire, the Stewartry of Kirkcudbright, Wigtonshire, and the town of Dumfries, were laid upon the table. The Board resolved to recommend the next general meeting to comply with the prayer of the requisition, and it was remitted to the Committee on General Shows to prepare the classes of stock for which premiums should be offered.

DAIRY EXHIBITION AT HAMBURG.—A letter was read from the Science and Art Department, London, transmitting a translation of a communication which had been addressed to the Secretary for Foreign Affairs by the German Chargé d'Affaires respecting an exhibition of dairy produce and utensils to be held at Hamburg in February next, and expressing their Lordships' hope that the Directors would be disposed to use their influence in furthering the objects of the proposed exhibition in such a manner as may be found practicable. The SECRETARY stated that the exhibition would embrace, among other things, fresh and salt butter, different kinds of cheese, all instruments which are required in dairy labour, as well as those which are required in keeping and using milk cattle, milking utensils, the various utensils and vessels used in the keeping of horned cattle, as well as in the production and consumption of milk, means of transport of milk; that more exact information with regard to the exhibition, the notice to exhibitors, and the time of the exhibition would soon be made public; and that in the meantime the papers sent could be seen on application at the Society's office, 3 George IV. Bridge, Edinburgh.

AGRICULTURAL PLANT.—A description of an agricultural plant for cattle-feeding and for paper-making, by Mr William Gorrie, Rait Lodge, Trinity, Edinburgh, was read.

RAEBURN EXHIBITION.—The SECRETARY reported that during the time the meetings of the Board were adjourned the Committee in charge of the Raeburn Exhibition had requested the loan of the picture by Sir Henry Raeburn of the late Mr Macdonald of St Martins (the original secretary of the Society); that he had communicated with the members of the Board individually, who had all cordially agreed to lend the picture for the purposes of the exhibition; and that it had been insured for £800, though no money could replace so fine a work of art. The Board approved of what had been done in the matter.

MISCELLANEOUS REMITS.—The following remits were made:—To the Committee on Office-Bearers, to report on vacancies and suggest list for 1877; to the Committee on Essays and Reports, to read and report on the papers lodged in 1876, and to revise the list for 1877; to the Committees on District Competitions and on Cottages and Gardens, to revise the awards for 1876, and consider the applications for 1877.

DISTRICT SHOWS.—The premiums awarded for brood mares in the district of Buchan and in the county of Kinross at the competitions held in 1875 were reported to have been finally adjudged as follows:—District of Buchan—1, Mr Alexander Bruce, Millhill; 2, Mr George Greig, Middlethorpe; 3, Mr William Anderson, Oldtown of Aquharnie. County of Kinross—1, Mr J. S. Stenhouse of North Fod; 2, Mr Thomas Beveridge, Balado; 3, Mr H. R. Anderson, Burtleigh.

MEETING OF DIRECTORS, 6TH DECEMBER 1876.

Present—Sir Alexander Jarline of Applegarth, Bart.; Mr Erskine of Cardross; Mr Findlay of Easterhill; Mr Findlay of Springhill; Mr Gillon of Wallhouse; Mr Hunter of Thurston; Mr Maxwell Inglis of Logan Bank; Mr Mackenzie of Portmore; Mr Kenneth Mackenzie, C.A.; Mr Munro, Fairington; Mr Murray of Dolerie; Mr Smith, Stevenson Mains; Mr David Stevenson, C.E.; Mr Stewart of Dirlston; Mr Swinton, Holybank; Mr Walker of Bowland, C.B.; Mr Pettigrew Wilson of Polquhain; Professor Wilson—Mr Munro, Fairington, in the chair. Mr F. N. MENZIES reported apologies for the absence of Sir George Macpherson Grant, Bart.; Admiral Sir William J. Hope Johnstone, K.C.B.; Mr Graham Biny, W.S.; Mr Howatson of Dornel; Mr Hutchison of Carlowrie; Mr Martin, yr. of Auchendennen; Mr Campbell Swinton of Kimmerghame, and Captain Tod of Howden.

Before proceeding to the business of the meeting, the following resolutions were unanimously passed:—

THE LATE MR JOHNSTONE OF BODESBECK.—"That intimation of the death of Mr James Johnstone of Bodesbeck, one of their number, having been made to the Directors of the Highland and Agricultural Society of Scotland, they resolved to express their sorrow for his loss, and their sense of his services as a member of the Board."

THE LATE MR HOPE OF BORDLANDS.—"That the death of Mr George Hope of Bordlands having been communicated to the Directors of the Highland and Agricultural Society of Scotland, they resolved to record their deep regret for his loss, and their sense of the obligations which the Society owed to him as a director, a member of council, and an examiner in agricultural education."

That these resolutions be engrossed in the minutes of the Society, and that the Secretary be instructed to transmit a copy of them respectively to the families of Mr Johnstone and Mr Hope.

BOARD AND GENERAL MEETINGS.—The next Board meeting was fixed to be held on the 10th instead of the 3d, and the anniversary general meeting on the 17th of January 1877.

FINANCE.—The SECRETARY, in submitting a statement of the funds at the close of the financial year on the 30th November reported that the books and vouchers had been placed in the hands of Mr Kenneth Mackenzie, C.A., the Society's auditor.

OFFICE-BEARERS FOR 1877.—The report by the Committee on Office-bearers for 1877 was given in, and the Secretary was instructed to communicate with the noblemen and gentlemen suggested to fill the vacancies which occur in January next before publishing their names.

CHEMICAL DEPARTMENT.—It was reported that at a meeting of the Committee in charge of the Chemical Department on the 29th ultimo, it had been remitted to the Con- vener and Secretary to look out for suitable ground for conducting experimental stations, and the Secretary stated that he would be glad to receive offers of ground for the purpose.

GENERAL SHOWS.—Edinburgh Show, 1877.—At the last meeting of the Board it was remitted to the Committee on General Shows to consider and arrange the premiums to be offered next year at Edinburgh. The Committee held its meeting on the 15th November, and have suggested premiums to the amount of about L.2700, being an increase of L.1100 over what was offered at Edinburgh in 1869. The list was approved, and will be submitted to a meeting of members to be held in the Society's hall, No. 3 George IV. Bridge, on Wednesday the 27th current, at 1.30 P.M.

Dumfries Show.—The classes for the proposed show at Dumfries in 1878, as suggested by the Committee on General Shows, were submitted to the Board previous to being laid before a meeting of members to be held at Dumfries on Wednesday the 20th current, at one o'clock.

DISTRICT SHOWS.—The reports by the Committees on District Shows and on Cottages and Gardens, detailing the awards at the various competitions held during 1876, and suggesting the districts in 1877, were submitted and approved.

TRANSFER OF PREMIUMS.—The SECRETARY stated that in the poultry awards at the Aberdeen show the first premium for grey dorking pullets was (in accordance with the report signed by the Judges and attending members) stated to have been awarded to Mr James Annand, Keith, and the second to Mrs George Armitstead, Inchmartine, but that the first prize ticket was placed on the pen belonging to Mrs Armitstead, and the second on that belonging to Mr Annand; and that, after communicating with the Judges and these parties, it had been agreed that the prize tickets had been correctly placed, Mrs Armitstead being declared the winner of the first prize. The Board approved of the transference.

INTERNATIONAL DAIRY EXHIBITION AT HAMBURG.—Copies of the programme of this exhibition were submitted, from which it appeared that application for exhibiting must be made at latest by the 15th of December, addressed to "The Exhibition Committee for the International Dairy Exhibition, Hamburg;" and that printed forms will be sent post free by the office of the Executive Committee on application. The exhibition will be opened on Wednesday the 28th of February 1877, and following days.

MEETING OF DIRECTORS, 10TH JANUARY 1877.

Present—Sir James Dalrymple H. Elphinstone of Logie-Elphinstone, Bart., M.P.; Sir Thomas Gladstone of Fasque, Bart.; Admiral Sir William J. Hope Johnstone, K.C.B.; Mr Graham Binny, W.S.; Mr Gillon of Wallhouse; Mr Howatson of Dornel; Mr Hunter of Thurston; Mr Hutchison of Carlowie; Mr Mackenzie of Portmore; Mr Kenneth Mackenzie, C.A.; Mr Martin, yr. of Auchendennan; Mr Bryden Monteith, Liberton Tower Mains; Mr Munro, Fairington; Mr Murray of Dolerie; Mr Oswald of Dunnikier; Mr David Stevenson, C.E.; Mr Swinton, Holyn Bank; Captain Tod of

Howden; Mr Pettigrew Wilson of Polquhain; Professor Wilson.—Mr Munro, Fairnington, in the chair. Mr F. N. MENZIES reported apologies for the absence of Sir Alexander Jardine of Applegarth, Bart.; Professor Balfour; Mr Ferguson, Kinnocherry; Mr Irvine of Drum; and Mr Walker of Bowland.

DEATH OF MR DICKSON, HERMISTON.—Before proceeding to the business of the day, the Directors resolved to record in the minutes the deep regret with which they regard the death of Mr Alexander Dickson, Hermiston, and to express their sense of the valuable services which the Society had for so long a period received from him as a member and Director.

OFFICE-BEARERS.—The SECRETARY reported that the names of the noblemen and gentlemen to be proposed by the Directors at the general meeting on the 17th inst., to fill the vacancies in the list for 1876, had been published in terms of the Bye-Laws.

GENERAL MEETING.—The programme of business to be brought before the anniversary general meeting on Wednesday the 17th current was arranged.

NEW MEMBERS.—The list of candidates for admission as members at the general meeting was submitted.

FINANCE.—The SECRETARY stated that the abstracts of the accounts for 1875-76 had been signed, in terms of the bye-laws, by two members of the Finance Committee, and by the auditor.

CHEMICAL DEPARTMENT.—The report by the Chemical Committee was submitted and approved. (See report at general meeting, 17th January 1877.)

EDINBURGH AND DUMFRIES SHOWS.—The SECRETARY stated that at a meeting of members connected with the three Lothians, held on the 27th December, the premium list and regulations for the general show to be held at Edinburgh on 24th of July, and three following days, had been submitted and approved; and that at a meeting held at Dumfries on the 20th of December, the classes of stock as arranged by the Directors were approved, subject to the following suggestions:—1. That in place of only one section for Galloway cows of any age, there should be two—viz., cows calved before and cows calved after 1st January 1875. 2. That in the Ayrshire breed there should be a section for three-year-old cows in milk. 3. That in fat stock a section for two-year-old Galloway heifers should be added. 4. That there should be four sections for Lincolns, same as Border Leicesters. 5. That in place of wether hogs of any cross not above one shear there should be two sections—viz., half-bred wether hogs not above one shear, and cross-bred wether hogs not above one shear. 6. That under wool there should be an additional section for best woolled tup of any other long-woolled breed. 7. That a class for dairy produce should be added with eight sections, as follow—Cured, powdered, and fresh butter; Cheddar cheese; Cheddar cheese, 14 lb. and under; Dunlop cheese; cheese of any other variety; cheese, flat make, any variety, under 15 lb. The Directors agreed to add the above classes, and to extend the four sections sanctioned for Lincolns to Leicesters, Cotswolds, Southdowns, and Shropshires, it being understood that the amount of money granted to these classes shall not be increased.

WORKS ON THE AGRICULTURE OF ITALY AND GREAT BRITAIN.—Letters were submitted from the Director of the Italian Agricultural Office, sending copy of work in two volumes on the agricultural conditions of that country from 1870 to 1874, together with an atlas of the principal cultivated grounds in Italy; and from Herr Theodor Koerner, Thorn, West Prussia, presenting a copy of a publication by him on the agriculture of Great Britain.

MEETING OF DIRECTORS, 17TH JANUARY 1877.

Present—The Duke of Buccleuch, K.G.; Sir William Forbes of Craigievar, Bart.; Sir Alexander Jardine of Applegarth, Bart.; Admiral Sir William J. Hope Johnstone, K.C.B.; Mr Graham Binny, W.S.; Mr Cochrane, Little Haddo; Mr Copland, Mill of Ardlothen; Mr Erskine of Cardross; Mr Ferguson, Kinnocherry; Mr Gillon of Wallhouse; Mr Milne Home of Wedderburn; Mr Hunter of Thurstone; Mr Hutchison of Carlowie; Colonel Innes of Learney; Mr Irvine of Drum; Mr Mackenzie of Portmore; Mr Kenneth Mackenzie, C.A.; Mr Murray of Dolerie; Mr Smith, Stevenson Maids; Mr David Stevenson, C.E.; Captain Tod of Howden; Mr Pettigrew Wilson of Polquhain; Professor Wilson.—Mr Mackenzie of Portmore in the chair. Mr F. N. MENZIES reported apologies for the absence of the Hon. G. R. Vernon; Sir George Macpherson Grant, Bart.; Mr Howatson of Dornel; Mr Maxwell Inglis of Loganbank; Mr Martin, yr. of Auchendunn; and Mr Munro, Fairnington.

The business had reference principally to the subjects to be brought before the general meeting of this date.

PROCEEDINGS AT GENERAL MEETINGS.

GENERAL MEETING, 14TH JUNE 1876.

Mr JOHN MUNRO, Faimington, Kelso, senior Ordinary Director, in the Chair.

NEW MEMBERS.—137 gentlemen were balloted for and elected.

ADDRESS TO THE PRINCE OF WALES.—The CHAIRMAN said—Before proceeding with the business of the meeting, I have to state that the Directors have prepared an address for presentation to the Prince of Wales on his return from India, and which will be laid before the Society for its approval.

Mr F. N. MENZIES, Secretary, then read the address, as follows:—

“To His Royal Highness the Prince of Wales.”

“May it please your Royal Highness,—We, the Highland and Agricultural Society of Scotland, incorporated by Royal Charter, in general meeting assembled, humbly desire to offer to your Royal Highness our sincere congratulations on the occasion of your return from your visit to India. When your Royal Highness graciously consented to become the President of our Society, we recognised in that act an earnest of your solicitude to promote the prosperity of the country, as founded on the progress of industry and the cultivation of the useful arts. We gratefully bear in remembrance that it has been under the beneficent sway of your royal ancestors that the industry of this country has been most favoured, and that agriculture, commerce, and all the arts of life have been most successfully cultivated. In like manner, we trust that from your visit to India, and your attention to the interests of that country, still greater advances may be made towards that solid strength of the State which is founded on the numbers, enterprise, and opulence of the people. It was extremely gratifying to us to hear of the cordial and loyal welcome accorded to your Royal Highness by all classes of Her Majesty’s Indian subjects, and we sincerely pray that the result may be to secure during ages to come that permanent attachment to the Crown which has been evinced on the present occasion.—Signed at the desire and in the presence of a general meeting of the Society held at Edinburgh on the 14th day of June 1876.

“JOHN MUNRO, Chairman.”

The address was unanimously adopted.

DEATH OF SIR ALEXANDER GIBSON-MAITLAND OF CLIFTON HALL, BART.—It was resolved by the Society, before proceeding to the business on the programme, to record in their minutes the deep regret with which they regard the death of Sir Alexander Charles Ramsay Gibson-Maitland of Clifton Hall, Bart., and to express their sense of the valuable assistance which the Society has for many years received from him as a Director and as a member of the Council on Agricultural Education. The meeting directed that a copy of the resolution be transmitted to Lady Gibson-Maitland, with their respectful condolence with her and her family under so painful a bereavement.

ARRANGEMENTS FOR THE ABERDEEN SHOW.—Mr GILLON of Wallhouse said—I have to report that the arrangements for the Aberdeen show are progressing satisfactorily. There was at one time some difficulties as to the Society’s getting the use of the links for a showyard, but these have been overcome. The showyard will be erected by Mr Richardson of Annan, who has been the contractor for the last four years. Mr Richardson will thus complete the period for which the contract was let—namely, five years. The following is a comparative statement of the entries at Aberdeen in 1868 and on the present occasion:—

	1868	1876
Cattle,	373	424
Horses,	139	227
Sheep,	632	448
Swine,	57	84
Poultry,	480	520
Implements,	1158	1812

The several sub-committees, as well as two attending members on each set of judges, were appointed at a meeting of the General Committee of Superintendance, held at Aberdeen on Friday last. The following are the committees appointed:—*Admission of Stock*—Mr Thomson, Newseat of Dumbreck (convener); Mr Salmoud, Nether Balfour; Mr G. J. Walker, Portlethen. *Admission of the Public*—Sir William Forbes of Cragievar (convener); Provost Annand, Inverurie; Sheriff Thomson; Bailie Donald; Mr W. Paul, Advocate; Mr Crombie of Grandholm; Mr Paterson, Auldtown of Carnousie; Mr Farquharson of Haughton. *Banquet*—Lord Provost Jamieson (convener); Sir J. D. H. Elphinstone of Logie Elphinstone, Bart., M.P.; Mr Irvine of Drum; Colonel Ferguson of Pitfour; Colonel Ramsay of Barra; Dean of Guild Walker; Lord Kintore; and Mr Grant of Drumminor. *Ball*—Sheriff Thomson (convener); Sir William Forbes of Cragievar, Bart.; Colonel Farquharson of Invercauld; the Marquis of Huntly; the Earl of Aberdeen; Mr Davidson of Desswood; and Mr W. Paul. *Forage Yard*—Mr Cochrane, Little Haddo (convener); Mr Campbell, Kinellar; and Mr Macdonald, factor, Cluny. *Police*—Lord Provost Jamieson (convener), Bailie Donald, and the Dean of Guild. *Accommodation of Strangers*—Bailie Donald and the Dean of Guild. The following gentlemen have been appointed attending members on the judges of the various classes of stock:—*Shorthorn*—Mr Lyall, Old Montrose; and Mr Copland, Mill of Ardlathen. *Polled Angus Aberdeen*—Colonel Ramsay of Barra, and Mr Cochrane, Little Haddo. *Galloway*—Mr Farquharson of Haughton, and Mr Leslie, Corskellie. *Ayrshire*—Colonel Innes of Learney, and Mr Walker, Ardlunkart. *Highland Cattle and Blackfaced Sheep*—Mr Grant of Drumminor, and Mr Macdonald, factor, Cluny. *Fat Stock*—Mr Stuart of Laithers, and Mr Lumsden, Braco. *Clydesdale Horses*—Colonel Ferguson of Pitfour, and Mr Mitchell, Auchmagathle. *Hunters*—Provost Wood, Banff; and Mr Adamson, Balquharn. *Cheviot Sheep*—Mr Leslie of Warthill, and Mr Campbell, Kinellar. *Border Leicester*—Mr Hannay of Gavenwood, and Mr Singer, Rothmaise. *Southdown and other Short-wooled Sheep*—Mr M'Combie of Easter Skene, and Mr Davidson, North Leys. *Swine*—Mr Nicol of Ballogie, and Mr Alexander, Bent of Haukerton. *Poultry*—Mr Scott of Brotherton, and Mr Cowie, Cromblybank. *Implements*—Mr Gordon of Newton; Mr Innes of Raenoir; Mr Auld, South Auchencloch; Mr Douglas, Haddo House; Mr Wilken, Waterside of Forbes; and Mr Smith, West Drums.

The report was adopted.

EDINBURGH SHOW, 1877.—The arrangements for next year's show, so far as yet made, are entirely satisfactory. The list of classes of stock, for which premiums will afterwards be offered, has been some time before the public. The counties embraced in the show have all agreed to a contribution in aid of the Auxiliary Fund.

The report was adopted.

AGRICULTURAL EDUCATION.—Mr IRVINE of Drum, in the absence of Professor Balfour, reported the result of the examinations for the Society's agricultural certificate and diploma, and for the prizes awarded in the agricultural class.

CHEMICAL DEPARTMENT.—Mr C. J. MACKENZIE of Portmore read the following report as to the Chemical Department:—"On behalf of the Committee in charge of the Chemical Department, I regret to have to report that Sir Thomas Buchan Hepburn has resigned the Chairmanship of that Committee. The Directors were unanimous in requesting Sir Thomas to reconsider his resignation; but as he adhered to it, the Directors were reluctantly obliged to accept it, and appointed me to discharge the duties of that office. The Committee at their first meeting thereafter passed the following resolution:—'The Committee cannot commence their report without expressing their regret at the loss of the valuable services of Sir Thomas Buchan Hepburn, who took so lively an interest in the Chemical Department, and who has for many years devoted so much time to the duties devolving upon him, first as a Member, and latterly as Convener of the Committee.' This resolution was cordially approved by the Board, and will, I am sure, be as warmly passed by you. (Applause.) I have now to report that, in consequence of the remit from the last General Meeting regarding the appointment of a chemist, the Directors, on the 2d of February, referred the matter to the Committee in charge of the Chemical Department. The Committee reported, on 25d February, that the best means of carrying out the instructions of the General Meeting was to advertise for a chemist qualified to organise and conduct the agricultural experimental stations about to be established, and who should devote his whole time to the Society; and they also prepared a note of the duties of the chemist in accordance with the directions of the General Meeting. This course was approved of by the Directors, who issued advertisements, in answer to which ten applications, besides various letters, were received. These were carefully gone over by the Committee, who reported on the 31st of May that they had considered all the applications and relative documents, and had come to the conclusion that none of the applicants combine all the qualifications necessary for the post of chemist to the Society. They considered, however, that some of the gentlemen who had applied were possessed in a

considerable degree of those qualifications. Under these circumstances the Committee could not recommend the Directors to appoint any of the gentlemen who had made application. The Committee also considered the letters received on the subject, and which were included in the remit to them; and they were of opinion if the restriction in regard to the entire services of the chemist being devoted to the Society were removed, that much more eligible candidates would be induced to come forward. The Committee also drew the attention of the Directors to the question of the absence of laboratory accommodation, which was a serious complication in the matter. The Committee's report having been submitted to the Directors at their meeting on the 7th instant, they approved of it, and resolved to report in terms of it to this meeting." I have now to move—"That the Society approve of the report of the Directors, and agree to rescind the restrictions imposed at last General Meeting in regard to the services of the chemist to be appointed being entirely devoted to the Society."

Sir ALEXANDER JARDINE of Applegarth seconded the motion.

Mr D. MILNE HOME of Wedderburn said he was sorry to say that he could not agree to the motion proposed by Mr Mackenzie—in the first place, because, looking at the proposal, he considered it highly inexpedient, irrespective of anything that had been done by the Society before, and also because it was entirely inconsistent with the resolutions that had been come to at the last two General Meetings. The proposal was that the Society should appoint a chemist with a salary of L.300, and be allowed to take other employment from other parties, and at the same time to receive remuneration from them. That was exactly the position of the late Dr Anderson. They were aware that that appointment was universally condemned, because when a chemist had L.300 a year, and also got remuneration from those who chose to employ him, it was very natural that a great deal of the Society's work should be neglected, and that as much as possible of the work of the public should be received. Afterwards, Professor Dewar was appointed, with a salary of L.150, to assist Dr Anderson. He would ask what was ever done by Mr Dewar for the Society for the L.150 he received! The proposal was that he was to give lectures, engage in field experiments, and make researches in agriculture. Now, did he ever carry out these things? They knew that for years Dr Anderson was unable to do anything for the Society. There was a sum of L.450 a year paid to two chemists—these being allowed to work for the public; and the result was that the Society got no benefit at all from the employment of these parties. How could they make such an injudicious appointment as was proposed? Every one complained against a continuance of the system followed by Dr Anderson, and the last two General Meetings adopted resolutions to the effect that the chemist should be paid with reference to the work he should do. At the last January meeting, the Directors came forward and asked that they should have leave to make an appointment of a permanent character. On the motion of Colonel Innes of Learney leave was given only to appoint a chemist in connection with the experimental stations of the Society, and who would give his whole time to the work of the Society. That was unanimously carried. The Directors concurred in it, and he was surprised that they, without any previous notice that he was aware of, should have made the proposal they had now done, and that at this meeting they should suddenly propose to rescind the resolution adopted at the last General Meeting and ask the Society to allow them to appoint a chemist without giving them his whole time. The resolution adopted at the previous meeting said that it was only in the event of experimental stations being established that a chemist was to be appointed. What did the Directors do? They advertised for a chemist before they knew that there were to be any experimental stations. He was surprised to hear in the report reference to stations "about to be established." These were not the words of the resolution. It declared that the whole time of the chemist was to be devoted to the Society, and he was to be appointed if the experimental stations were to be established —

Mr C. J. MACKENZIE read the resolution which had been adopted at the previous meeting, which stated that the employment of the chemist would be limited to the organisation and management of the stations.

Mr MILNE HOME said that there had been no stations established by the Society.

Mr MACKENZIE said that they had not yet been organised.

Mr MILNE HOME said there was as yet no prospect of having stations established. He had asked the Secretary if there was any prospects of having them, but he understood that there was no land offered —

Mr F. N. MENZIES (Secretary)—On the contrary, I mentioned that there had been offers made.

Mr MILNE HOME—Then why has that not been mentioned? The very first thing that the Directors should have done was to say whether the stations were to be established. He would ask, if they appointed a chemist to-day, what work was he to do? By the resolution the work he was to be allowed to do was in connection with the experimental stations. He thought it was most inexpedient to get into the old track, and especially as it was utterly inconsistent with the resolution come to

that it was only after the stations were to be arranged that a chemist should be appointed. The Aberdeen farmers found that they could get five stations, and after that, and not till then, they employed a chemist. He firmly believed that the Society would not get stations. In the first place, there was no money for them. The Directors stated that there was to be a sum of L.700 for a chemist and the stations. They proposed to give L.300 to a chemist, and where was the other L.400? They had already struck off L.200 of the L.700, and there was only L.200 left. Was that enough to carry on the work? He did not think so. They ought first to get the stations, and then make the appointment —

The CHAIRMAN—Do you make any motion?

Mr MILNE HOME—No; I only enter my protest. I warn the Directors that if they agree to the proposal now made they will hear more of it at next meeting.

Mr C. J. MACKENZIE said that a great deal of what Mr Milne Home had stated was inconsistent with the facts. The Directors had all along been of opinion that they should have the services of a chemist competent to carry on the stations, and one who could give his whole time to the work; but if they failed to get a competent person to do so, they felt that the next best thing to do was to appoint one who could give them a portion of his time. As to what Mr Milne Home had said as to Dr Anderson and Mr Dewar, he did not wish to enter into that question, as it was rather a personal affair. If the Society had sufficient confidence in their Directors to leave to them to appoint the best man they could get to do the work, the Society could only ask them to give their confidence to the extent proposed, and they might rest satisfied that it would not be abused. As to what had been said regarding Mr Dewar, that gentleman was very anxious and willing to do his work, but it was because no work was provided for him that he did not do it. Therefore the mere fact that Mr Dewar did not do the work did not tell against him at all. Mr Milne Home complained that he got no notice of the present proposal, but the only notice the Directors could give was the publication in the newspapers of the resolution of the last meeting of the Directors, from which it would be seen that they intended to make the proposal. They had taken the only means they had of making known their intention. As to the objection that there was no need to appoint a chemist at present, it struck him that they must begin somewhere. It was working in a circle, and they must break it at some point. If they could not get a chemist to give his advice, what was the use of getting the land? It was very likely they would get the land gratuitously, and they had no intention to appoint a chemist till they saw that they could get work for him. They had already had offers of land, and they must have powers to appoint a competent chemist before they arranged as to the stations. They could then put into operation the plans of Sir Thomas Hepburn. There were none of the Chemical Committee who could undertake the organisation and direction of these matters without the professional aid of a chemist; and if they were allowed to appoint such a man, the Directors would put him into work at once.

Mr MASON, Corstorphine Hill, said he did not think that they would get a chemist for L.300 a year—L.500 was more like the sum they should offer. There were many men who did little or nothing, and little better than labourers, who got L.2 a week for their work, and how could they expect that they could get a man well skilled in chemistry to do what they wanted for L.300 a year? In connection with this matter, if they could get one hundred men to give L.10 each, he would be his share.

Mr MELVIN, Bonnington, said he thought there was a good deal of truth in what Mr Mason had said, and he had always held that there should not be less than L.500 offered to a chemist. He very much agreed with what Mr Milne had said, but he did not entirely agree with him. He did not see why the scheme of experimental stations could be set agoing without a head. He did not suppose that they could ask any of the Directors to take the charge. They wanted an official who could be taken to task if the work was neglected. A practical agricultural chemist was the first person they should appoint, but he did not see why they should take merely a portion of his time, which would likely be the far part of it. They wanted an energetic young man to carry out the organisation of the scheme. Professor Anderson was a very able man in his own department, but he did not study agricultural chemistry in such a way as to satisfy the wants of the agriculturists of Scotland. He did not think that the Society was so very hard up as not to be able to give L.500 a year to a chemist. He had seen that within the last ten years they had added nearly L.20,000 to the funds of the Society. In the year 1864-65 the funds amounted to about L.49,000, and in the last report they were stated at L.68,000. Here they had L.19,000 added to the funds of the Society, and he thought that they should not go on starving the progress of science in agricultural matters by hearing up their money, but that they might be a little more liberal and give L.500 for the chemist, and L.500 for the experimental stations. If they then found it necessary to do more they could then apply to the liberality of Mr Mason.

Mr MILNE HOME said he quite agreed that there must be a chemical head to the experimental stations. All he said was that they should not make the appointment till they had the prospect of carrying on the experimental stations, and the money for carrying them on.

Mr C. J. MACKENZIE said that the Directors would take care that the chemist would not be appointed till there was sufficient work for him to do.

Mr MILNE HOME asked if that limitation would be fixed upon in leaving the matter in the hands of the Directors.

Mr C. J. MACKENZIE said he did not think it was right to fix down the Directors as was proposed by Mr Milne Home; but he did not hesitate to say that it was their intention to carry out what he had mentioned.

Mr MILNE HOME said he would agree to what had been proposed, taking into account the statement by Mr Mackenzie.

The motion by Mr Mackenzie was then unanimously agreed to.

THE CELTIC CHAIR.—The SECRETARY read the following petition from Professor Blackie:—

“COLLEGE, 24th May.

“To the Highland and Agricultural Society of Scotland—

“The Petition of John Stuart Blackie, Professor of Greek in the University of Edinburgh.

“The Directors of the Highland Society are doubtless aware from the public prints that a scheme has been put forth for the erection of a Celtic Chair in the University of Edinburgh, which has received the support of Her Most Gracious Majesty the Queen, of his Grace the Duke of Buccleuch, his Grace of Argyll, his Grace of Sutherland, the Most Noble the Marquis of Bute, and other distinguished members of the aristocracy; also of many of the most distinguished scholars in England, Scotland, and Ireland; not less of the whole Gaelic people both at home and in the Colonies, as the papers herewith sent will sufficiently show. It seems therefore only natural, and would certainly be both popular and politic, that the Highland Society of Scotland, following up the example early set by the publication of the *Scoto-Celtic Dictionary* under their auspices, should not be absent in the roll of those who have so nobly come forward to aid this patriotic undertaking. The Directors will observe that the professorship is not confined to the Celtic literature of the Scottish Highlands, but includes Irish, Welsh, Manx, and Armenian, and is intended to secure that there shall always be in the Metropolitan University of Scotland a scholar capable to expound scientifically the earliest records of British history, and to enable Scotland to take the place in the growing science of comparative philology, which her possession of a large Celtic population seems to call upon her to resume. The Sanscrit Chair, some years ago created by the liberal intelligence of Dr John Muir, only requires to be supplemented by the chair of Celtic and a chair of Romanesque languages, to make Edinburgh the most completely equipped philological school in Britain. Hoping that the Highland Society will look favourably on the scheme of the University as one in which they have a special interest,—I have the honour to be, your most obedient,

(Signed)

“JOHN S. BLACKIE.”

The CHAIRMAN said that a similar application had been twice before the Directors, and they did not on either of these occasions see their way to acquiesce in making any grant. Since a third application had been brought before them, the Directors thought that the best course to adopt would be to submit the petition to this General Meeting for its decision.

The HON. GEORGE WALDEGRAVE LESLIE—Is the object of this petition embraced within the charters of the Society?

The CHAIRMAN—There is no mention in the charters of anything of the kind, but in the original regulations of the Society there was an allusion to Celtic literature.

The SECRETARY said that in the regulations of 1784 it was set forth that the objects of this Society shall be—(1) An enquiry into the present state of the Highlands and Islands of Scotland and the condition of their inhabitants; (2) an enquiry into the means of their improvement by establishing towns and villages, by facilitating communication through different parts of the Highlands of Scotland by roads and bridges, advancing agriculture, and extending fisheries, introducing useful trades and manufactures, and by an exertion to unite the efforts of the proprietors, and call the attention of Government towards the encouragement and prosecution of these beneficial purposes; (3) The Society shall also pay a proper attention to the preservation of the language, poetry, and music of the Highlands.” The operation of the Society was at first limited to matters connected with the improvement of the Highlands of Scotland; but the supervision of certain departments proper to that part of the country having been subsequently committed to special Boards of Management, several of the earlier objects contemplated by the Society were abandoned, while the progress of agriculture led to the adoption of others of a more general character.

Mr MILNE HOME said he was present at a meeting of the Directors a few weeks ago,

when an opinion was given by the Secretary to the effect that this was a matter within their province. The Highland Society of London had given a sum for aiding the endowment of this chair, and it was a pity if the Highland Society of Scotland was not to do something in the matter. He had seen a paper lately showing that not less than L.8000 had been subscribed for this chair. He understood that L.10,000 was required, and after what Mr Melvin had stated regarding their funds, they could surely give L.50 to aid in what many of the members of the Society had subscribed for out of their own pockets. They had, as a Society, assisted in the publication of a Gaelic dictionary, and of various other Gaelic books, and he thought they could afford to give L.50 for this object.

Mr A. CAMPBELL SWINTON of Kimmerghame said that the Directors best knew whether they could afford this, and if they could give a donation of L.50, it would be a graceful thing for the Society to do. It was undoubtedly comprised within their original objects, and their charter was obtained for the purpose of enlarging rather than diminishing their operations. The Secretary had stated that several of the earlier objects were abandoned because of the supervision of certain departments—

The SECRETARY—Like the fisheries and manufactures.

Mr CAMPBELL SWINTON—I do not think there is any special board of management which has for its object the promotion and maintenance of Celtic literature. This is not a Celtic chair in the sense of its being a Gaelic chair, but a chair for a very important subject connected with the prosecution of comparative philology. He did not think that L.50 would be a great drain on their resources, and the giving of such a contribution would be a very graceful thing on the part of the Society.

Mr MACKENZIE said that if the meeting was cordially in favour of this suggestion, it would be an easy matter for the Directors to enquire into the state of their funds, and say whether they could see their way to give a grant of L.50. They were assured by one gentleman that Professor Blackie would be glad to see the name of the Highland Society on the list of contributors, although they were to spread the subscription over three or five years. If they were to do that, they might not feel it so much as by giving the contribution in the lump.

Mr A. CAMPBELL SWINTON—I think we may safely leave the matter in the hands of the Directors. Nobody has expressed any feeling of decided opposition, and the Directors can again take the matter into their consideration.

Professor WILSON said he wished simply to mention that when this matter was discussed by the Directors, some one of the members suggested that L.50 would be a very poor subscription on the part of a Society such as this, and that if they gave anything at all it should not be less than L.100. It was upon that sum being mentioned that the suggestion was made that the money might be spread over different periods.

Mr MACKENZIE—I was merely following the lead on the sum that had been mentioned by Mr Milne Home.

Mr MILNE HOME—Then let it be understood that the Directors have power to give to the extent of one hundred guineas.

The Hon. G. WALDEGRAVE LESLIE—It should be remitted to them to see whether such a grant is within the original objects of the Society; and if so, that should be stated in giving the grant.

The SECRETARY—The original objects were never rescinded, although the Society is under a new charter.

The Hon. GEORGE WALDEGRAVE LESLIE—A statement that it is within the objects of the Society will shut out endless demands for money.

The petition was then remitted back to the Directors.

VETERINARY CHARTER. Captain TOD of Howden then said—I have to report that on the 24th of May a deputation from the Society waited on the Lord President at the Privy Council Office, for the purpose of asking that a charter should be granted to the Society, by which their powers of granting certificates might be extended to that of diplomas. The deputation consisted of the Earl of Dalkeith, M.P.; the Earl of Dalhousie; the Earl of Strathmore; the Earl of Mar and Kellie; the Earl of Southesk; Lord Oranmore; the Hon. George Waldegrave Leslie; Sir E. Colebrooke, M.P.; Sir William Edmonstone, Bart., M.P.; Sir Thomas Gladstone; Sir Alexander Gordon, M.P.; Sir William Stirling-Maxwell, M.P.; Sir Graham Montgomery, M.P.; Mr Vans Agnew, M.P.; Mr C. Dalrymple, M.P.; Mr Mackintosh, M.P.; Mr McLagan, M.P.; Mr Ramsay, M.P.; Mr Yeaman, M.P.; Mr Dundas of Arncliffe; Captain Tod; Mr Arthur E. Baird; Mr T. A. Dollar, V.S.; Mr Findlay Dun; and Mr Menzies. The Earl of Dalkeith introduced the deputation; and after various remarks by several members, the Duke of Richmond said the memorial should receive his earnest consideration.

The report was adopted.

VETERINARY DEPARTMENT. Captain TOD reported that the examinations for the Society's veterinary certificate took place on the 17th, 18th, and 19th April, when twenty students presented themselves for examination, and that the following fourteen

gentlemen passed:—Alexander Chivas, Peterhead; Owen Coll, Bruree, Limerick; John Edward Grey, Edinburgh; William Hunter, Newcastle-on-Tyne; A. J. Kelly, Navan, County Meath; William Stuart Low, Burntisland; James M'Bryde, Mochrum; John M'Fadyean, Newton-Stewart; James Murray, Castlehill, Calthness; Robert Rain, Castle-Douglas; Henry Snarry, Malton; George Watson, Middlesborough; George W. Watson, Orkney; Daniel Webster, Riccall, York. The two medium gold medals given to the students who passed the best practical and the best general examination were awarded as follow:—*Best Practical Examination*—Robert Rain, Castle-Douglas. *Best General Examination*—John M'Fadyean, Barrachan, Newton-Stewart.

This report was also adopted.

STEAM CULTIVATION.—The Hon. GEO. WALDEGRAVE LESLIE asked if there was any arrangement for the exhibition at Aberdeen of agricultural implements worked by steam?

The SECRETARY—I believe there is to be an exhibition of steam apparatus at Aberdeen if land can be obtained for the purpose.

The Hon. WALDEGRAVE LESLIE said he was glad to hear that there was the prospect of such an exhibition.

TRANSACTIONS.—Mr Forbes Irvine having had to leave the meeting, Mr F. N. MENZIES laid on the table the 8th volume of the Transactions, and stated that it had been sent to all members who had applied for it.

The Hon. GEORGE WALDEGRAVE LESLIE then moved a vote of thanks to the Chairman, and the meeting separated.

GENERAL MEETING, 17TH JANUARY 1877.

His Grace the DUKE OF Buccleuch and Queensberry, K.G., in the Chair.

ELECTION OF MEMBERS.—Eighty-seven noblemen and gentlemen were balloted for in the manner prescribed by the charter and bye-law, and admitted as members.

VOTE OF THANKS TO THE PRINCE OF WALES.—The Noble CHAIRMAN moved the adoption of the following resolution:—"That his Royal Highness the Prince of Wales, having presided over the Society for the period of four years prescribed by the charter, thereby sustaining the dignity and promoting the interests of the Society, the cordial thanks of the meeting are eminently due to his Royal Highness on retiring from office." His Grace went on to say that it was of very great importance to the country, and also to the Society, that they should have had the advantage of the countenance of the Prince of Wales as their president. His Royal Highness fully intended to have been present at the meeting of the Society on one occasion particularly, and he had made arrangements to attend, when circumstances occurred to prevent him. They must all deplore his absence, but they knew, from his having accepted the office of president, the interest he had taken in the Society, and what his feelings were generally with regard to Scotland.

The resolution was unanimously agreed to.

ELECTION OF PRESIDENT.—Mr MACKENZIE of Portmore said he had much pleasure in proposing for the office of president of the Society a nobleman worthy in every point of view to fill it—namely, the Most Noble the Marquis of Lothian.

Mr ERSKINE of Cardross seconded the motion. He said he believed it would be the unanimous feeling of the meeting that a more worthy successor of the Prince of Wales as president of the Society could not be got than Lord Lothian. They had had many proofs of the interest he had taken in the Society, and he believed that under the noble Lord's presidency the prosperity of the Society would be continued.

The motion was unanimously agreed to, and the Marquis of Lothian took the chair to loud applause.

The Noble CHAIRMAN said that the first duty that fell to him to perform in his new office was to thank the meeting in the most cordial manner for electing him president of the Society. When he first received the communication from the Directors asking him if he would accept the office if offered to him, his first inclination, not as a matter of feeling merely, but of heart, was that there were many others more capable than he was of undertaking the office, but he felt, at the same time, that the matter lay with the Directors and the meeting; and that if they elected him he could not do otherwise than accept the office. He could not sufficiently express his gratification at having been unanimously elected. At the same time, he felt that the office of president of the Society was not entirely an honorary one, but that there were responsibilities attached to it also. He felt the weight of these responsibilities, in consequence of the illustrious names of those who had held the office before him, both in regard to position and experience in agricultural operations. He could, however, say that in accepting the office to which they had done him the honour to elect him, it would be his endeavour as far as he could to advance the objects of the Society. It was impossible but that

in the great work carried on by a Society like this there should be differences of opinion as to minor details; but he hoped that during his tenure of office there would be a unanimous feeling, as far as possible, in the work of the Society, and that it might be able to carry on that work in which it had hitherto been engaged with much success.

OFFICE-BEARERS.—The following noblemen and gentlemen were elected to fill the other vacancies in the list of office-bearers:—*Vice-Presidents*—The Marquis of Tweeddale, the Earl of Haddington, the Earl of Wemyss and March, and the Earl of Rosebery. *Ordinary Directors*—Sir George Douglas Clerk of Penicuik, Bart.; Sir James R. Gibson-Maitland of Clifton Hall, Bart.; Thomas A. Hog of Newliston; Anthony Murray of Dollerie; Thomas Mylne, Niddrie Mains; William Ritchie of Middleton; Charles Smith, Whittinghame; and Captain W. J. Wauchop of Niddrie Marischal. *Extraordinary Directors*—The Right Hon. Sir James Falshaw, Bart., Lord Provost of Edinburgh; the Earl of Dalkeith, K.T., M.P.; Lord Elcho, M.P.; the Hon. Charles Hope of Bridge Castle; Sir Hew Dalrymple of North Berwick, Bart.; Sir William Baillie of Polkemmet, Bart.; Arthur James Balfour of Whittinghame, M.P.; Robert Bryson, Master of the Merchant Company, Edinburgh; Robert Dundas of Arniston; and Peter M'Lagan of Pumpherston, M.P. *Members of Council on Education*—Robert Dundas of Arniston and John Munro, Fairnington.

DECEASED MEMBERS.—The Duke of Buccleuch said that in the absence of the Honorary Secretary, and in his name, he had been asked to make the following statement:—Before proceeding further to the business on the programme, I think it right that I should briefly refer to the loss sustained by the Society since the last anniversary General Meeting by the death of several old and respected members in various walks of life. Among these I have first to advert to the late Marquis of Tweeddale, in grateful remembrance of whose long and distinguished services, both to the country and the Society, the Directors embraced the earliest opportunity of testifying their sense and of expressing their regret at his loss. No person, his Grace went on to say, connected with the Society could hold a higher place than the Marquis did, or was more universally esteemed not only by the members of the Society, but by all who had an opportunity of knowing him and becoming acquainted with his worth. I have next to notice the names of Viscount Melville and Lord Herries, the Right Hon. Sir John Stuart of Lochcarron, Lord Neaves and Lord Ardmillan, Sir James Horn Burnett, Bart.; Sir James Hall, Bart.; Sir Alexander Gibson-Maitland, Bart.; and Sir James Campbell of Stracathro. And then in alphabetical order I may mention—Mr Baird of Auchmedden, Mr David Bryce, architect; Mr Fletcher Campbell of Boquhan, Mr Dickson, Hermiston; Mr Gibson, Woolmet; Mr Hope of Bordlands, Mr Hope Johnstone of Amandale, Mr Johnstone of Bodesbeck, Mr Murray of Geanies, Mr Napier of Shandon, Mr John Swan, Edinburgh, and Mr David Tweedie, Castle Crawford. In regard to all those who had been members of the Board, the Directors have already passed resolutions expressive of the sense they entertained of their loss. The Directors having already done that, I think that we of the Society may give expression to our own feeling of regret. Out of a body comprising upwards of 4500 members, it will be easily conceived that it would occupy too much of your time to name all the deaths that annually occur, but I cannot overlook the Hon. Lady Menzies of Menzies, who has for many years been an exhibitor at the general shows, and took great interest in the Society.

THE ACCOUNTS FOR 1875-76.—Mr MURRAY of Dollerie laid on the table the accounts for 1875-76, and stated that the abstract for the year showed on the charge side a total of £796, 11s., and the discharge £706, 11s. 8d., leaving a balance in the Royal Bank, as at November 30, of £88, 19s. 4d., which would enable the Society to carry on its operations successfully. The Directors had voted a sum of £105 to the Celtic Chair. The accounts of the Aberdeen Show state that the expense to the Society was about £650.

THE ARGYLE NAVAL FUND.—Admiral Sir WM. J. HOPE-JOHNSTONE read the abstract of the accounts of the Argyll Naval Fund, which stated that there was a balance in the bank at 30th November last of £439 5s. 11d., and he also gave a statement as to the origin and progress of the scheme.

ABERDEEN SHOW, 1876.—Mr GILLON of Wallhouse said—On behalf of the Directors I have the gratifying duty of reporting that the Show at Aberdeen realised the highest expectations entertained for its success. As compared with the great meetings of former years, it was of equal interest. The entries of stock and implements were highly satisfactory, both as regards numbers and quality. In regard to the implements selected for trial after the Show, I may mention that the Machinery Committee have, after minute and careful trials, recommended, and that the Directors have confirmed, an award of fifty guineas, on account of the Fisker steam ploughing tackle, an exhaustive report on which will appear in the forthcoming volume of the Transactions. It is well known that several of the office-bearers and others had a great deal of trouble, and that they discharged their duties to the entire satisfaction of all parties. I have therefore to move—'I. That the thanks of the Society be given to the Right Hon. the Earl of Strathmore, Vice-President, for his attention to the matters of the Aberdeen

Show, and for having occupied the chair at the President's dinner in the absence of His Royal Highness the Prince of Wales. 2. That the thanks of the Society be given to the Right Hon. the Earl of Aberdeen, Vice-President, for acting as croupier on the same occasion. 3. That the thanks of the Society be given to the Commissioners of Supply for the counties of Aberdeen, Banff, and Forfar for the liberality with which the Auxiliary Fund was provided. 4. That the thanks of the Society be given to George Jamieson, Esq., Lord Provost, and the other civic authorities of Aberdeen, for the aid afforded by them, and particularly for the free use of the Links for the purposes of the Show. 5. That the thanks of the Society be given to Alexander Forbes Irvine, Esq., of Drum, Convener of the Local Committee elected by the counties of Aberdeen, Banff, Kincardine, and Forfar, for his unsparing exertions, and to the individual members of that committee for their judicious arrangements, contributing so effectually to the success of the meeting."

The motion was unanimously agreed to.

EDINBURGH SHOW, 1877.—Mr GILLON said—I have next to report that the arrangements for the Show to be held at Edinburgh are proceeding satisfactorily, and the Directors entertain the hope that the meeting will be the greatest that has yet been held in Scotland, and that it will prove in every respect worthy of the city and the important districts more immediately interested. The period fixed for the Show is from Tuesday the 24th to Friday the 27th of July next, both days inclusive. On this occasion it is proposed that the yard should be opened on the first day to the public at eleven in place of one o'clock. The Directors have applied to the Town Council of Edinburgh for permission to hold the Show on the West Meadow. The application has been remitted by the Council to the Lord Provost's Committee, with powers. At the last Edinburgh Show, in 1869, the sum offered in premiums was L.1660. This year the list is the largest that has ever been given by the Society, amounting to L.2714, comprising L.935 for cattle, L.791 for horses, L.435 for sheep, L.15 for best-woolled tups of the Cheviot blackfaced, and Leicester breed (the premium for the best-woolled tups is a new feature at our Shows, and was introduced on the suggestion of the late Marquis of Tweeddale), L.93 for swine, L.138 for poultry, and the usual medium gold medals to former prize animals. The charge for stall rent is under the consideration of the Board, and will be fixed when the rates of the contract for the erection of the show are known. In regard to the Implement Department, I may state that money premiums and medals are restricted to new inventions or improvements on implements of agriculture, horticulture, and forestry. That collections of articles, not agricultural, will be received for exhibition, but the Secretary is empowered to refuse entries from dealers in articles not deemed worthy of exhibition. The regulations for stock bear that the name of the breeder, if known, must be given; and if the breeder is not known, a declaration to that effect, signed by the exhibitor, must be sent along with the schedule, and no pedigree will be entered in the catalogue when the breeder is unknown. Mr Dundas of Arniston has been chosen Convener of Local Committee. The competition for the premium of £50 offered for the best thoroughbred stallion to serve in the three Lothians has been fixed to be held at Edinburgh on Wednesday the 14th of March. Entries for this exhibition must be made with the Secretary, and will close on the 10th of March.

DUMFRIES SHOW, 1878.—Mr GILLON said—I have finally to report that during the autumn of last year the Directors received requisitions, influentially and numerously signed by the proprietors, tenants, and others connected with Dumfriesshire, the stewartry of Kirkcudbright, and Wigtownshire, to hold the Show for 1878 at Dumfries. The Board approving of the same, the preparatory steps of arranging the classes of stock, for which premiums will be afterwards be offered, and of submitting them to a meeting of members held at Dumfries on the 20th of December last, have been carried out. From the cordial way in which the gentlemen connected with the district have taken the matter up, I have no doubt that everything will be done to ensure the same success which attended the last meeting held at Dumfries. I have only further to submit the classes of stock as adjusted by the Board, and to move that the meeting approve of the Show being held at Dumfries in 1878, and that the Directors be empowered to make the usual arrangements.

The motion was agreed to.

DISTRICT COMPETITIONS.—Mr CAMPBELL SWINTON of Kimmerghame said—I have to submit to the Meeting the report on the district competitions, which shows that the Society's money premiums or medals have been in operation in 281 districts during the past year—viz., stock, 32; special grants, 6; minor premiums and medals, 55; ploughing competitions, 188. The arrangements made for the current year embrace the usual premiums to 36 districts for stock, 5 special grants, minor premiums and medals to 53 districts, besides the plough medal, which is given under certain conditions without previous application. As the details, both of the premiums awarded and of those offered, will appear in the forthcoming volume of the Society's "Transactions," I need only occupy the time of the meeting by moving the approval of the report.

Mr MYLNE, Niddrie Mains, called attention to the circumstance that the grant of L.50 to the Edinburgh Christmas Club had been withdrawn. The Committee were very grateful to the Society for the support they had got all along, without which they would perhaps have not been in the position they now were, and although they had now got a good place for the Show, they were not in such funds as that the grant should be withdrawn. Owing to their being unable to give good premiums, the best animals went past the Edinburgh Show to Birmingham, Sheffield, and Leeds. He hoped that the Directors would continue the grant.

Mr CAMPBELL SWINTON said that this matter had received the very anxious consideration of the Directors, and he would remind his friend Mr Mylne that when the special grant was first given, it was plainly stated that it was only to be a temporary grant. The Society had never pledged itself to continue it. A member of the Committee who was connected with the Club had stated that it was now so prosperous that it might very well do without their aid. If they continued the grant now it might become a permanent vote, which was never contemplated. The grant was given when the Club was instituted in order to encourage it; and it was now so fat and prosperous, like the cattle it exhibited, that it did not now need the Society's aid.

Mr PATERSON of Birthwood said that the grant had been given to those who instituted the Club in order to assist in carrying it on. They had gone on for ten years. Two years ago the Club was insolvent, and although they had now entered on prosperity to a very small extent, if the Society withdrew the grant he was afraid they had seen the last of the Christmas Shows. He thought that the money was well spent in the encouragement of the Show; and he moved that the grant of L.50 be continued.

The Earl of DALKEITH said he thought that his friend Mr Campbell Swinton had brought forward no really strong argument why the L.50 should be withdrawn. He had not shown that the Club was misusing the grant, or that they could do without it. He thought it was of very great importance that the Club should be kept going at present at any rate. They had had great difficulties to contend with, and very bad buildings in which to show the stock. They had got this year for the first time a very good building in which to hold the Show, but if the money was withdrawn he believed it would be a very serious affair for the Christmas Show. Not only was there a show of fat stock, but a large show of poultry at the same time, and he thought that the Highland Society was not in that position that they could not afford the grant. It would not embarrass the Society, and the money would be given in a manner which would forward the agricultural interests in this part of the country. He hoped that unless the Directors had any very strong reason to give for refusing the grant they would be willing to reconsider it.

The SECRETARY stated that the District Show Committee had recommended that the grant to the Club should be continued, but that it should not become permanent. The grant had been withdrawn because a new member of the Club opposed it, as the Club was now able to meet its own claims.

Mr BETHUNE of Blebo said he hoped that the Directors would reconsider their decision. The Club had now got a Showyard which was the best in Great Britain; but still they required the grant.

The Noble CHAIRMAN said that the balance of the arguments seemed to be in favour of continuing the grant.

It was then agreed to restore the grant of L.50 for one year. The report was otherwise approved of.

COTTAGE COMPETITIONS.—In the absence of the Conveuer, Mr MACKENZIE of Portmore reported that the money premiums awarded in 1876 amounted to L.13, 10s, besides eighteen medium and eighteen minor silver medals in fifteen districts; and that the premiums to be offered in 1877 amount to L.21, twenty medium silver, and twenty-eight minor silver medals in sixteen districts. Besides the premiums to cottagers, it is proposed to continue the offer of two gold medals—first, to the proprietors in Scotland who shall report the improvement of the greatest number of cottages during 1874, 1875, and 1876; and second, to the proprietor in Scotland who shall report the erection of the greatest number of approved cottages during the years 1873, 1874, 1875, and 1876.

"TRANSACTIONS" FOR 1877. Mr IRVINE of Drum said—I have to report that the "Transactions" for 1877 (vol. 9 of the new series) is partly in type, and that as many of the prize essays and reports which will be announced to-day will be included as, with the proceedings, the premium list for 1877, and the list of members, will make the volume the usual size.

CHEMICAL DEPARTMENT.—Mr MACKENZIE of Portmore read the following report by the Chemical Committee:—On the occasion of the general meeting in June last, the report then brought forward narrated the steps taken by the Directors and Committee with the view of carrying out the resolution of the general meeting of January 1876. By that resolution it will be remembered the appointment of a chemist was to be provisional and for a limited period, and was to embrace the entire service of the

person employed. As the best means of carrying out the resolution the Directors issued advertisements, in answer to which certain applications were received. These were carefully gone over by the Committee, who reported that none of the applicants combined all the qualifications necessary for the post of chemist to the Society. The Committee's report was adopted by the Directors, and accordingly a motion was made at last general meeting that the Society should rescind the restriction imposed in regard to the services of the chemist being entirely devoted to the Society. This motion was, after some discussion, agreed to, the Chairman of the Chemical Committee undertaking on the part of the Directors that no chemist should be appointed till there was sufficient work for him to do. This resolution was by the Directors, at their meeting on the 1st of November, referred to the Chemical Committee, who at their first meeting thereafter remitted to the Chairman and the Secretary to look out for suitable ground for conducting experimental stations. The Committee held a second meeting on the 27th December, when it was reported as the result of the conference above referred to that a letter had been addressed to a certain number of noblemen and gentlemen in the Lothians asking if they would be disposed to afford the Society say ten acres of land and labour for conducting experiments, and that favourable replies had been received from several of them agreeing to do so, provided they approved of the conditions on which the land and labour are required. The Society having now got these offers of suitable land is in a position to proceed at once to establish the experimental stations. The first object being to discover whether such experimental stations can be worked so as to produce adequate results, it is of very great importance that whatever is undertaken should be done thoroughly and well. The present available funds are limited, but there is little doubt that larger resources would be forthcoming should it be satisfactorily shown from the working of these pioneer stations that real benefit to the agriculture of the country can be obtained from the establishment on a permanent footing of similar stations in various parts of Scotland. It should therefore be the object of the Society to concentrate its efforts, and to undertake in the first instance no more than can be worked with thorough efficiency with the funds at its command. It will also be to the advantage of the experiment that these pioneer stations should be very readily accessible from the head-quarters of the Society. Until the Directors can ascertain from practical experience the expense of forming and working these stations, they consider it prudent that they should limit themselves in the first instance to two stations—the one, say, in Mid-Lothian, and the other in East Lothian. Other stations could be selected and added should the funds prove sufficient, and should it appear proper to do so. As regards the size of the stations, they consider that they should be about 10 acres each, which would enable the experiments to be carried out on a sufficiently extensive scale to ensure fair average results, and they accordingly asked for plots of that size in the letters before referred to. Bearing in mind that these experimental stations are being formed for the benefit of agriculture generally, and with no expectation on the part of the Society that they will prove remunerative in themselves, it has been hoped that parties will be found willing to aid the Society in its endeavours, by making arrangements with it in a liberal spirit; and with such an idea in view the Directors think that the following stipulations may be found sufficient:—The Society should undertake to fence their whole plot in each case with a substantial fence, and to maintain it as a thoroughly sufficient fence so long as they retain the land; to provide all artificial manures, seeds, &c.; to pay for all labour afforded by the granters of land at a sufficient rate to be agreed on; and to offer them all produce which is over and above that which may be required for seed, analysis, or experiment, at market rates in cases where rent is required, and gratis when the land is given free. For its own security the Society should make the fence round each plot proof against ground game. The granters of land should undertake to supply labour and implements whenever called upon at a full fair rate to be agreed on; to supply farm yard manure, also at a fixed rate; to allow their overseers to protect the plots under the Society's chemist; and to continue the occupation of the plots to the Society so long as they may be required for these experiments, and to relieve the Society of them at a year's notice, on condition of their being left in a state at least equal to that in which they were received. The granters of land also to supply house accommodation, or to allow the Society to put up temporary erections for storage, &c. As regards the appointment of a chemist to organise and superintend the stations, the Society being now in a position to commence operations, the Directors propose to proceed at once to select and appoint a suitable person, so that the coming season may not be lost.

Mr MILNE HOME of Wedderburn said he was sorry that the Committee had not afforded sufficient information in the report to enable the Society to form an opinion on the propriety of the stations. He agreed with the report in regard to the principles on which the stations should be conducted; but as to engaging a chemist, they were not told how he was to be paid under the arrangement by which only a portion of his time was to be given to the Society. They had had the experience of a chemist paid by salary and giving them only a portion of his time when they had Dr Anderson and

Dr Dewar, and he asked whether during the last two years they rendered any service to the Society at all. Mr Lawes of Rothamstead, instead of employing a chemist to manage his experimental farm, which was the best of the kind in the country, employed an intelligent practical agriculturist, and when chemical analysis was required application was made to a chemist. At Cirencester the same plan was followed. As he understood, however, the proposal that the Society should have a practical agriculturist had been dropped. It was proposed instead that the stations to be established should be under the charge of a chemist; and he wanted to know how that chemist was to be paid and the other expenses of the stations met out of the £500 available for the undertaking. He wished that the Directors should give the Society a fuller and more distinct report.

Mr CHARLES DUNCAN, Rothesay, thought that as the whole scheme was an experiment, they should give the Directors justice, and an opportunity of carrying out their intentions for two or three years, after which they should see the result.

Mr WILSON, Edlington Mains, said he should have no objection whatever to a tentative trial; but the question was, whether they should again appoint a chemist, with a fixed salary, as a permanent officer of the Society.

Mr MACKENZIE said that the appointment of a chemist was to be merely for a limited period, and as an experiment.

Mr MILNE HOME—What salary?

Mr MACKENZIE said the Committee were not bound to give the £300, if they could get the work done for less. Mr Milne Home was himself a member of the Committee, and under his supervision they might rest assured they would not give more than was necessary.

Mr WILSON said there was a want of information in the report. If the scheme was merely tentative, and the Directors would in a year or two bring the matter again before the Society, he had not the smallest objection to offer to the proposal.

Mr MACKENZIE said that there was not the slightest wish on the part of the Committee to withhold information; but they could not tell what the chemist's salary would be till they made arrangements with the man. The Society might rest assured they would do nothing rash. Their whole object was to produce a result worthy of the Society and of the funds entrusted to them.

Mr MILNE HOME said that there had been no arrangements made for securing land for any station whatever, and therefore he did not think the time had yet come for appointing a chemist.

Mr BETHUNE of Blebo said he was not afraid that the Committee would do anything rash; he was afraid that they would do nothing at all.

The Noble CHAIRMAN said he thought that after the discussion which had taken place it might be safely left to the Committee and the Directors to carry out the proposal.

The report was then adopted.

AGRICULTURAL EDUCATION.—Professor WILSON reported that Mr Robert Lyall, Catechery, Watten, Caithness, and Mr William Reekie, Walton, Auchtertool, Fife, had passed for a bursary of £20 each, and that Mr D. G. Braidwood, Parlayvine, Lasswade, Mid-Lothian, for one of £20.

THE EDUCATION BOARD.—Mr WILSON, Edlington Mains, said it was known to every one present that there was prevailing all over Scotland a strong and growing conviction that the Scotch Board of Education should be put on a permanent footing, and its powers enlarged; and he wished to ask whether it might not be well for the Directors of the Highland Society to consider the expediency of concurring with other public bodies who were moving in this matter, in which they were all interested.

The Noble CHAIRMAN said there was no doubt that the question was of the greatest possible interest; but he felt some difficulty as to the course which should be followed, as he thought it was scarcely within the scope of the Society's functions to memorialise Government in reference to the subject.

Mr MILNE HOME said that the Society had a charter enabling them to promote the cause of education, and they spent a great deal of money on instruction given in elementary schools. They voted £250 a year to young men coming from elementary schools to the Scottish Universities, and so far, he thought, that might give them power to entertain the question. He did not say the Directors should take up the matter now before them in the way other bodies were doing, but it might be well that they should be allowed to consider it as one of great public importance, and take what steps they thought necessary.

The Duke of Buccleuch said there was no doubt that the Society was very much interested in the education that was afforded in the elementary schools. He quite agreed that the Education Board of Scotland should be made independent and permanent. A great deal of very useful information might be imputed to children in the parochial schools; but he was afraid these schools were fast drifting into merely elementary education, or what was commonly called the three R's. So long as the greatest

number of children got the smattering of education which accorded with a certain code, the higher branches were thrown on one side. He saw no reason whatever why in the parochial schools, as formerly, the higher branches of education should not be taught. The first elements of botany, he might say, would be a very essential thing for children to learn in an agricultural country, so that they might know the difference between the useful plant and the noxious weed. He believed that some of the unfortunate accidents to children had occurred from ignorance of that subject. He thought there was a good deal in what had been said. Whether they should as a Society move in the matter was a question to be considered; but it was a subject which a Society consisting of between 4000 and 5000 members should not entirely ignore. Whatever they found it their duty to do he hoped they would not hesitate to express the opinion of so large and influential a body of educated men upon a subject not only so interesting but of such vital importance to the welfare of the country.

Professor BALFOUR said that the Society was at present doing good work in the way of education by encouraging young men to come forward and get prizes. Perhaps they might do more good that way than by petitioning.

The Noble CHAIRMAN said that from what had been stated he thought it might be within the power of the Directors to approach the Government on the subject. He would suggest, therefore, that the meeting approve of the question being referred to the Directors with powers to take such steps as they might deem expedient.

Mr CHARLES DUNCAN, Rothesay, expressed his approval of what had been suggested by the Chairman.

The proposal was then agreed to.

VETERINARY DEPARTMENT.—Captain TOD of Howden said—It will be in the recollection of those who attended the general meeting in June last, that on that occasion I reported that a deputation from the Society had waited, on the 24th of May, on the Lord President, at the Privy Council Office, for the purpose of supporting a petition for a charter to the Society empowering it to grant veterinary diplomas. I regret that I have now to intimate that the prayer of the Society's petition has been refused. The letter from the Privy Council Office is in the following terms:—

“Privy Council Office, 12th December 1876.

“My Lord,—I am directed by the Lord President of the Council to inform you that the Lords of the Council have given their careful consideration to the petition of the Highland and Agricultural Society of Scotland, praying for the grant of supplemental charter; and I am instructed to state that their Lordships have felt it their duty to advise her Majesty not to comply with the prayer of the petitioners.—I have the honour to be, my Lord, your Lordship's obedient servant,

(Signed) “C. L. PEEL.

“The Earl of Strathmore, Vice-President,
Highland and Agricultural Society of Scotland.”

This communication was before the Directors on Wednesday last, when it was remitted for the consideration of the Society's Veterinary Committee. It is not for me to say what further steps the Committee may recommend, or the Directors adopt; but I may venture to state that I consider the Society is in a manner bound, in the meantime, to continue the examinations.

The Duke of Buccleuch asked if there had been any reasons given for that decision?

Captain TOD—No.

The Duke of Buccleuch said it was perhaps nothing more than jealousy on the part of the Veterinary College in London that anything better than itself should be tolerated.

AGRICULTURAL REPORTS.—Mr IRVINE of Drum (in the absence of Mr Walker of Bowland, Convener) reported the premiums awarded for agricultural reports, and those offered for competition in 1877, which were approved of.

FORESTRY DEPARTMENT.—Professor BALFOUR reported the awards in the Forestry Department, as well as those offered for competition in 1877, which were approved of.

The proceedings concluded with a vote of thanks to the President, which was proposed by Mr HUNTER of Thurston.

PREMIUMS AWARDED BY THE SOCIETY IN 1876-77.

I.—REPORTS, 1877.

AGRICULTURAL.

1. James Macdonald, "Scotsman" Reporter, Aberdeen, for a Report on the Agriculture of the Counties of Ross and Cromarty,	L.39	0	0
2. Thomas Farrall, Aspatria, Carlisle, for a Report on the Agriculture of the Counties of Edinburgh and Linlithgow,	15	0	0
3. Thomas Farrall, Aspatria, Carlisle, for a Report on the Polled Angus or Aberdeen Breed of Cattle,	10	0	0
4. Alexander Leslie, Ashley Terrace, Aberdeen, for a Report on Agricultural Experimental Stations,	10	0	0
5. J. B. Smyth, Forester, Duff House, Banff, for a Report on the Comparative Return from Capital Invested in Cropping, Grazing, or Planting Land upon Hill and Moorland,	10	0	0

FORESTRY.

6. William Gorrie, Rait Lodge, Trinity, Edinburgh, for a Report on the Tree Mallow,	10	0	0
7. Robert Hutchison of Carlowrie, Kirkliston, for a Report on the <i>Taxodium sempervivens</i> (or red wood),	5	0	0
8. Robert Hutchison of Carlowrie, Kirkliston, for a Report on the <i>Picea Nordmanniana</i> ,	5	0	0
9. Thomas Wilkie, Forester, Invergarry, N.B., for a Report on the Management of Plantations,	5	0	0

L.160 0 0

II.—GLASGOW SHOW, 1875.

Alexander Guthrie, Craigo, Montrose, for Double Drill Potato-Planter on the Cup principle (at Trial at Liberton Mains, 4th April 1876),	L.10	0	0
J. W. Robinson & Co., Liverpool, for Aspinwall's Patent Single-Drill Potato-Planter on the Needle principle (at Trial at Liberton Mains, 4th April 1876),	10	0	0
A. Ingermann, of Koldnoss, Gravenstein, for Patent Weed Eradicator, exhibited by Ord & Maddison, Darlington (at Trial at Craigmillar, 15th June 1876) Medium Gold Medal,	6	2	0

L.26 2 0

III.—ABERDEEN SHOW, 1876.

CLASS I.—CATTLE.

SHORTHORN.

SECTION 1. BULLS calved before 1st January 1874.

1. James A. Gordon, Udalc, Invergordon, "Rosario" (35,315),	L.25	0	0
2. William A. Mitchell, Auchinagathle, Whitehouse, Aberdeen, "Duke of Chumburgh" (35,652),	15	0	0
3. Thomas W. Cook, Castletown of Asloun, Alford, "Lisle" (31,602),	10	0	0
Breeder of Best Bull—A. H. Browne, Doxford, Chathill,	0	16	0

Very Highly Commended, William S. Marr, Upper Mill, Tarves "Royal Prince" (35,378). Highly Commended, James Christie, Bankend, Stirling, "Squire Marshall." Commended, Alexander Buchanan, Whitehouse, Stirling, "Heather-bred Lad" (31,346). Commended, Major Ramsay of Barra, Straloch, Aberdeen, "Ferdinand."

SECTION 2. BULLS calved after 1st January 1874.

1. James Bruce, Burnside, Fochabers, "Earl of March" (33,807),	25	0	0
2. James Watt, Garbly, Fochabers, "Frederick Fitz Windsor 2d,"	15	0	0
3. George Shields, Horspukeuch, Dunse, "Scottish Errant" (35,486),	10	0	0

H. C., John Cran, Kirkton, Banchrew Station, Inverness, "Bridegroom" (33,291).

Carry forward, L.100 16 0

Brought forward, L.100 16 0

SECTION 3. BULLS calved after 1st January 1875.

1. The Duke of Buccleuch and Queensberry, K.G., Dalkeith, "King Errant,"	15	0	0
2. Jas. Lawrence, Thornhill, Forres, "Lord of the Forth,"	10	0	0
3. Her Majesty the Queen, the Prince Consort's Shaw Farm, Windsor, "Duke of Bedford,"	5	0	0
V. H. C., The Duke of Richmond and Gordon, K.G., Gordon Castle, Fochabers, "Royal Fairfax." C., Alexander M. Ogilvie, Tillynaught, Portsoy, "William Lawrie."			

SECTION 4. COWS of any Age.

1. William A. Mitchell, Auchnagathle, Whitehouse, Aberdeen, "Alma,"	20	0	0
2. William S. Marr, Upper Mill, Tarves, "Clara 28th,"	10	0	0
3. James Lawrence, Thornhill, Forres, "Lady Elma 3d.,"	5	0	0
V. H. C., George Marr, Cairnbrogie, Old Meldrum, "Daisy 6th." H. C., The Duke of Richmond and Gordon, K.G., Gordon Castle, Fochabers, "Interlude." C., Charles Bruce, Broadland, Huntly, "Lady Eliza 2d."			

SECTION 5. HEIFERS with own calves at foot calved after 1st January 1874.

1. James Cochrane, Little Haddo, Newburgh, "Geraldine 6th.,"	15	0	0
2. Andrew Longmore, Rettie, Banff, "Isobel,"	10	0	0

SECTION 6. HEIFERS calved after 1st January 1874.

1. James Tweedie, Deuchrie, Prestonkirk, "Grand Cherry,"	15	0	0
2. Her Majesty the Queen, the Prince Consort's Shaw Farm, Windsor, "Carolina 5th.,"	10	0	0
3. William S. Marr, Upper Mill, Tarves, "Missie 49th."	5	0	0
V. H. C., George Bruce, Keig, Whitehouse, Aberdeen, "Blossom." C., William S. Marr, Upper Mill, Tarves, "Missie 48th."			

SECTION 7. HEIFERS calved after 1st January 1875.

1. William S. Marr, Upper Mill, Tarves, "Emma 4th.,"	10	0	0
2. Major John Ramsay of Barra, Straloch, Aberdeen, "Young Roan Lady,"	8	0	0
3. W. A. Fraser, Brackla, Nairn, "Gipsy Queen."	5	0	0
V. H. C., James Cochrane, Little Haddo, Newburgh, "Jealousy 14th." C., James Lawrence, Thornhill, Forres, "White Rose."			

POLLED ANGUS OR ABERDEEN.

First Prize Bulls at former Shows.—Exhibited for Medium Gold Medal.

Inverness, 1874, when the property of Alexander Bowie, Mains of Kelly, Arbroath—The Earl of Fife, K.T., Duff House, Banff, "Gainsborough" (596), Glasgow, 1875, when the property of the present Exhibitor—The Marquis of Huntly, Aboyne Castle, Aberdeen, "Duke of Perth" (357),	6	2	0
	5	0	0

SECTION 8. BULLS calved before 1st January 1874.

1. The Earl of Fife, K.T., Duff House, Banff, "Young Viscount" (736),	20	0	0
2. William M. Skinner, Drummin, Ballindalloch, "Adrian 2d" (622),	10	0	0
3. George Reid, Baads, Peterculter, "Prince Albert 2d" (745),	5	0	0
4. Alexander Bowie, Mains of Kelly, Arbroath, "Gainsborough 3d" (598),	3	0	0
Breeder of Best Bull—William Duff, Hillochhead, Glass, Aberdeenshire,	0	16	0
V. H. C., R. B. Walker, Portlethen Mains, Aberdeen, "Bacchus" (607). H. C., The Marquis of Huntly, Aboyne Castle, Aberdeen, "Pluto" (602). C., Robert Walker, Montbleton, Banff, "Gavenwood" (843).			

SECTION 9. BULLS calved after 1st January 1874.

1. The Earl of Fife, K.T., Duff House, Banff, "St Clair,"	20	0	0
2. James M-Kessack, Earnside, Forres, "Scotia" (789),	10	0	0
3. Lieut.-Col. George A. Ferguson of Pitfour, Mintlaw, "Logie the Laird 3d" (862),	5	0	0
4. The Earl of Airlie, Cortachy Castle, Kirriemuir, "Belus,"	3	0	0
V. H. C., Representatives of the late Alexander Paterson, Mulben, Keith, "Hero," (861). H. C., Cecil F. Gwyer, Biallid, Kingussie, "Juniper" (742). C., Robert Walker, Montbleton, Banff, "Rory o' More" (844).			

Carry forward, L.331 14 0

Brought forward, L.331 14 0

SECTION 10. BULLS calved after 1st January 1875.

1. John Hannay, Gavenwood, Banff, "Sir Wilfred,"	10 0 0
2. Sir George Maepheron Grant of Ballindalloch, Bart., "Judge,"	5 0 0
3. William Duff, Hillockhead, Glass, "Statesman of Hillockhead,"	3 0 0
4. William M'Combie of Easter Skene, Skene, "Aberdonian,"	2 0 0
V. H. C., The Earl of Fife, K.T., Duff House, Banff, "Gladulus." H. C., James Merson, Craigwillie, Huntly, "Earl of March" (932), C., Sir William G. G. Cumming of Altyre, Bart., Forres, "Senator" (863).	

First Prize Cows at former Shows—Exhibited for Medium Gold Medal.

Inverness, 1874, when the property of the present Exhibitor—William James Tayler, Rothiemay House, Huntly, "Kate 2d" (1482),	6 2 0
Glasgow, 1875, when the property of the present Exhibitor—The Marquis of Huntly, Aboyne Castle, Aberdeen, "Dora" (1282),	5 0 0

SECTION 11. COWS of any Age.

1. The Earl of Fife, K.T., Duff House, Banff, "Innes" (1934),	20 0 0
2. Sir George Maepheron Grant of Ballindalloch, Bart., "Eva" (984),	10 0 0
3. William M'Combie of Easter Skene, Skene, "Blackberry" (1813),	5 0 0
4. The Earl of Fife, K.T., Duff House, Banff, "Patience of Corskie" (1932),	3 0 0
V. H. C., The Earl of Fife, K.T., Duff House, Banff, "Violet of Montbletton" (1399). H. C., The Earl of Fife, K.T., Duff House, Banff, "Blackbird of Corskie" (1704). C., The Earl of Fife, K.T., Duff House, Banff, "Crocus" (1400).	

SECTION 12. HEIFERS with own calves at foot, calved after 1st January 1874.

1. The Earl of Aberdeen, Haddo House, Aberdeen, "Kate of Haddo House" (2261),	10 0 0
2. The Earl of Fife, K.T., Duff House, Banff, "Maria 2d" (1251),	6 0 0
3. George Wilken, Waterside of Forbes, Alford, "Waterside Dandy 2d" (2071),	4 0 0
4. John Hunter, Confunderland, Alford, "Bella of Confunderland" (1985),	2 0 0

SECTION 13. HEIFERS calved after 1st January 1874.

1. John Hannay, Gavenwood, Banff, "Zingra" (2471),	10 0 0
2. George Reid, Baads, Peterculter, "Isa" (1965),	6 0 0
3. William M'Combie of Easter Skene, Skene, "Lady Anne,"	4 0 0
4. William M'Combie of Tillyfour, Aberdeen, "Alice,"	2 0 0
V. H. C., Sir Thomas Gladstone of Fasque, Bart., Laurencekirk, "Emilie." H. C., George Reid, Baads, Peterculter, "Lady Irvine" (1963). C., William James Tayler, Rothiemay House, Huntly, "Kate Duff" (1837).	

SECTION 14. HEIFERS calved after 1st January 1875.

1. William M. Skinner, Drumlin, Ballindalloch, "Gaiety" (2219),	8 0 0
2. The Earl of Fife, K.T., Duff House, Banff, "Katrine,"	5 0 0
3. Sir Thomas Gladstone of Fasque, Bart., Laurencekirk, "Eurydice,"	3 0 0
4. The Earl of Fife, K.T., Duff House, Banff, "Erica 6th,"	1 0 0
V. H. C., James Moir, Mains of Wardhouse, Inch, "Hawthorn of Wardhouse" (2467). H. C., Sir George Maepheron Grant of Ballindalloch, Bart., "Flirt" C., William M'Combie of Easter Skene, Skene, "Mermoid."	

GALLOWAY.

First Prize Bulls at former Shows—Exhibited for Medium Gold Medal.

Inverness, 1874, when the property of the present Exhibitor—The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Black Prince of Drumlanrig" (546),	6 2 0
Glasgow, 1875, when the property of the present Exhibitor—James Cunningham, Tarbrooch, Dalbeattie, "Cunningham" (824),	5 0 0

SECTION 15. BULLS calved before 1st January 1874.

1. James Graham, Parcelstown, Longtown, "Sim of Whitram" (562),	20 0 0
2. George Graham, Oakbank, Longtown, "Forest King" (553),	10 0 0
3. Peter Morton, Lawshall, Longtown, "Mosstrooper,"	5 0 0
Breeder of best Bull—James Cunningham, Tarbrooch,	0 16 0
H. C., The Duke of Buccleuch and Queensberry, K.G., Drumlanrig Castle, Thornhill, "Baron Scott" (656)	

Carry forward, L.508 14 0

Brought forward, L.508 14 0

SECTION 16. BULLS calved after 1st January 1874.

1. James Jardine Paterson of Balgray, Lockerbie, "Bob,"	20 0 0
2. M. & T. Teasdale, Bogg, Knaresdale, Alston, "Robin Hood,"	10 0 0

SECTION 17. BULLS calved after 1st January 1875.

1. James Cunningham, Tarbreoch, Dalbeattie, "The Mackintosh" (1009),	10 0 0
2. Peter Morton, Lawshall, Longtown, "Border Reiver,"	5 0 0
3. George Graham, Oakbank, Longtown, "Viscount Preston" (1008),	3 0 0

First Prize Cows at former Shows—Exhibited for Medium Gold Medal.

Inverness, 1874, when the property of the present Exhibitor—The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Juno of Drumlanrig" (1641),	6 2 0
Glasgow, 1875, when the property of the present Exhibitor—James Cunningham, Tarbreoch, Dalbeattie, "Maid Marion 4th" (1668),	5 0 0

SECTION 18. COWS of any Age.

1. The Duke of Buccleuch and Queensberry, K.G., "Nightingale of Drumlanrig" (1650),	20 0 0
2. James Cunningham, Tarbreoch, Dalbeattie, "Bride of Brampton" (2188),	10 0 0
3. The Duke of Buccleuch and Queensberry, K.G., "Ilythia of Drumlanrig" (1307),	5 0 0
H. C., James Cunningham, Tarbreoch, Dalbeattie, "Bridesmaid." C., The Duke of Buccleuch and Queensberry, K.G., "Melantho of Drumlanrig" (1643.)	

SECTION 19. HEIFERS calved after 1st January 1874.

1. James Cunningham, Tarbreoch, Dalbeattie, "Lady Stanley 2d,"	10 0 0
2. The Duke of Buccleuch and Queensberry, K.G., "Beauty of Drumlanrig" (1755),	6 0 0
3. The Duke of Buccleuch and Queensberry, K.G., "Duchess of Drumlanrig" (2618),	4 0 0
H. C., The Duke of Buccleuch and Queensberry, K.G., "Britomartis of Drumlanrig" (1754). C., James Cunningham, Tarbreoch, Dalbeattie, "Bessy."	

SECTION 20. HEIFERS calved after 1st January 1875.

1. James Cunningham, Tarbreoch, Dalbeattie, "Lady Stanley 3d,"	8 0 0
2. James Graham, Parcelstown, Longtown, "Mary of Parcelstown 2d" (2606),	5 0 0
3. The Duke of Buccleuch and Queensberry, K.G., "Countess of Drumlanrig" (2621),	3 0 0
H. C., The Duke of Buccleuch and Queensberry, K.G., "Fanny 2d of Drumlanrig" (2623). C., The Duke of Buccleuch and Queensberry, K.G., "Hannah 3d of Drumlanrig" (2620).	

AYRSHIRE.

First Prize Bulls at former Shows—Exhibited for Medium Gold Medal.

Glasgow, 1875, when the property of the present Exhibitor—William Smith, Chanlockfoot, Penpont, Dumfriesshire, "The Shah,"	5 0 0
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SECTION 21. BULLS calved before 1st January 1874.

1. Robert Gillespie, Boyleston, Barrhead, "Cardigan,"	20 0 0
2. John Anderson, Smithstown, Croy, Kilsyth, "Walter,"	10 0 0
3. James Wilson, Boghall, Bishopton, "Topsman,"	5 0 0
Breeder of Best Bull—J. Kirkwood, Wolfcrooks, Douglas,	0 16 0

SECTION 22. BULLS calved after 1st January 1874.

1. Robert Wilson, Forehouse, Kilbarchan, "Marquis,"	15 0 0
2. Duncan Keir, Bucklyvie, "Borland,"	8 0 0
3. The Duke of Buccleuch and Queensberry, K.G., "Sir Walter of Drumlanrig,"	5 0 0

SECTION 23. BULLS calved after 1st January 1875.

1. The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Craigman,"	10 0 0
2. Duncan Keir, Bucklyvie, "Jardine,"	5 0 0
3. William Smith, Chanlockfoot, Penpont, "The Prince,"	3 0 0
C., John Lindsay, Thornhill, Stewarton, "Joek."	

Carry forward, L.725 12 0

Brought forward, L.725 12 0

SECTION 24. COWS in Milk, of any age.

1. A. R. Foulds, Clerkland, Stewarton, "Douglas,"	.	.	.	.	20	0	0
2. Robert Wilson, Forehouse, Kilbarchan, "Maggie,"	,	.	.	.	10	0	0
3. Robert Wilson, Forehouse, Kilbarchan, "Miller,"	.	.	.	.	5	0	0
C., The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, Thornhill, "Border Queen."							

First Prize Cows at former Shows—Exhibited for Medium Gold Medal.

Inverness, 1724, when in milk, and the property of the present Exhibitor—The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Dewdrop,"	.	.	.	.	6	2	0
Inverness, 1874, when in Calf, and the property of the present Exhibitor—The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Modesty,"	.	.	.	.	6	2	0
Glasgow, 1875, when in milk, and the property of the present Exhibitor—The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Ruby,"	.	.	.	.	6	2	0

SECTION 25. COWS in Calf of any Age, or HEIFERS in Calf, calved before 1st January 1874.

1. John M. Martin, Auchendennan Farm, Balloch, "Frost,"	.	.	.	.	15	0	0
2. William Guthrie, Square Hotel, Cumnock, "Stately,"	.	.	.	.	10	0	0
3. The Duke of Buccleuch and Queensberry, K.G., "British Queen,"	.	.	.	.	5	6	0
V. H. C., Robert Wilson, Forehouse, Kilbarchan, "Princess." H. C., The Duke of Buccleuch and Queensberry, K.G., "Flora of Drumlanrig." C., John Stewart, Burnside Cottage, Strathaven, "Rosie."							

SECTION 26. HEIFERS calved after 1st January 1874.

1. The Duke of Buccleuch and Queensberry, K.G., "Jessie of Drumlanrig,"	.	.	.	.	10	0	0
2. The Duke of Buccleuch and Queensberry, K.G., "Gem of Drumlanrig,"	.	.	.	.	6	0	0
3. Mrs Douglas, Green, Kilmalcolm, "Beauty,"	.	.	.	.	4	0	0
H. C., The Duke of Buccleuch and Queensberry, K.G., "Baroness of Drumlanrig." C., John Stewart, Burnside Cottage, Strathaven, "Fleeky."							

SECTION 27. HEIFERS calved after 1st January 1875.

1. The Duke of Buccleuch and Queensberry, K.G., "Beauty,"	.	.	.	.	8	0	0
2. The Duke of Buccleuch and Queensberry, K.G., "Modesty 2d of Drumlanrig,"	.	.	.	.	5	0	0
3. Mrs Douglas, Green, Kilmalcolm, "Brookie,"	.	.	.	.	3	0	0
H. C., The Duke of Buccleuch and Queensberry, K.G., "Lady 3d of Drumlanrig."							

HIGHLAND.

First Prize Bulls at former Shows—Exhibited for Medium Gold Medal.

Inverness, 1874, when the property of the present Exhibitor—The Duke of Athole, K.T., Blair Castle, "Sgiathanach,"	.	.	.	.	6	2	0
Glasgow, 1875, when the property of James Campbell, Ormaig, Kilmartin—The Master of Blantyre, Scibbers Cross, Rogart, "Gille Riabhach,"	.	.	.	.	6	2	0

SECTION 28. BULLS calved before 1st January 1875.

1. John Grant, Inverlaidnan, Carr Bridge, "Wallace,"	.	.	.	.	20	0	0
2. John Stewart, Duntuln, Portree, "Rob Roy,"	.	.	.	.	10	0	0
3. Alexander S. Stevenson, Auchinclellan, Ford, Lochaweside, "Royal George,"	.	.	.	.	5	0	0
Breeder of Best Bull—The Earl of Seafield, Castle Grant, Grantown,	.	.	.	.	0	15	0
V. H. C., John Grant, Inverlaidnan, Carr Bridge, "Rob." H. C., John Cumming, Killiehuntly, Kingussie, "Murach."							

SECTION 29. BULLS calved after 1st January 1875.

1. A. & J. McNaughton, Kerrowmore, Glenlyon, Aberfeldy, "Gille Dubh,"	.	.	.	.	20	0	0
2. The Earl of Seafield, Castle Grant, Grantown, "Corrychrone,"	.	.	.	.	10	0	0

SECTION 30. BULLS calved after 1st January 1874.

1. John Stewart, Duntuln, Portree, "Eilaneach,"	.	.	.	.	10	0	0
2. John Stewart, Bocharlie, Callander,	.	.	.	.	5	0	0
3. James Campbell, Ormaig, Lochgillphhead, "Gille Din,"	.	.	.	.	5	0	0
V. H. C., Trustees of the late Robert Peter, Ular, Aberfeldy, "Gille Buidhe." H. C., Peter Sinclair, Upper Largie, Kilmartin, "Duntroon." C., Alexander Aitkenhead, Cowglen, Pollokshaws, "Sandy."							

Carry forward, L.910 18 0

	Brought forward,	L.940 18 0
First Prize Cows at former Shows—Exhibited for Medium Gold Medal.		
Inverness, 1874, when the property of the present Exhibitor—The Duke of Athole, K.T., Blair Castle, "Buidheag,"	6	2 0
Glasgow, 1875, when the property of the present Exhibitor—John Stewart, Bochastle, Callander,	5	0 0

SECTION 31. COWS of any age.

1. The-Duke of Athole, K.T., Blair Castle, Blair Athole, "Te Ruadh Mhor,"	15	0 0
2. John Stewart, Duntuhn, Portree, "Donnach Dearg,"	8	0 0
3. The Duke of Athole, K.T., "Donnag,"	4	0 0
V. H. C., John Stewart, Bochastle, Callander. H. C., John Stewart, Duntuhn, Portree, "Guanach Biabhach." C., The Earl of Seafield, Castle Grant, Grantown, "Countess."		

SECTION 32. HEIFERS calved after 1st January 1873.

1. John Stewart, Duntuhn, Portree, "Targheal Bheag,"	10	0 0
2. John Stewart, Bochastle, Callander,	5	0 0
3. John Stewart, Duntuhn, Portree, "Dubh Mhollach,"	3	0 0
V. H. C., the Earl of Seafield, Castle Grant, Grantown, "Jessie." H. C., The Earl of Breadalbane, Taymouth Castle, Aberfeldy, "Mally." C., The Earl of Seafield, Castle Grant, Grantown, "Mary."		

SECTION 33. HEIFERS calved after 1st January 1874.

1. The Duke of Athole, K.T., Blair Castle, Blair Athole, "N Odhar Mhor,"	8	0 0
2. The Earl of Seafield, Castle Grant, Grantown, "Bynack,"	4	0 0
3. The Earl of Breadalbane, Taymouth Castle, Aberfeldy, "Christina,"	2	0 0
V. H. C., The Earl of Seafield, Castle Grant, Grantown, "Dulnain." H. C., The Trustees of the late R. Peter, Urlar, Aberfeldy, "Stale Ruadh." C., The Trustees of the late R. Peter, Urlar, Aberfeldy, "Iashbail Ruadh."		

FAT STOCK.

SECTION 34. HIGHLAND OXEN calved after 1st January 1872.

1. Sir William G. Gordon Cumming of Altyre, Bart., Forres,	6	0 0
2. John Jas. Dalgleish of Ardnamurchan, Brankston Grange, Culross,	3	0 0

SECTION 35. HIGHLAND OXEN calved after 1st January 1873.

1. The Duke of Sutherland, K.G., Dunrobin Mains, Golspie,	5	0 0
2. Sir William G. Gordon Cumming, of Altyre, Bart., Forres,	2	0 0

SECTION 36. POLLED OXEN calved after 1st January 1873.

1. J. & W. Martin, New Market, Aberdeen,	6	0 0
2. James Stephen, Conglass, Inverurie,	3	0 0

SECTION 37. POLLED OXEN calved after 1st January 1874.

1. William M'Combie of Tillyfour, Whitehouse, Aberdeen,	5	0 0
2. William M'Combie of Tillyfour, Whitehouse, Aberdeen,	2	0 0
Commended, Thomas Bland, Greystone, Alford.		

SECTION 38. OXEN of any other Pure or Cross Breed calved after 1st January 1873.

1. James Reid, Greystone, Alford (Cross),	8	0 0
2. Thomas Bland, Greystone, Alford (Cross),	4	0 0
3. James Bruce, Inverquhomery, Longside, Aberdeen (Cross),	2	0 0
V. H. C., Henry D. Adamson, Balquhairn, Alford (Cross). H. C., J. & W. Martin, New Market, Aberdeen (Cross). C., George Wilken, Waterside of Forbes, Alford, "Waterside Jock" (Cross).		

SECTION 39. OXEN of any other Pure or Cross Breed calved after 1st January 1874.

1. Henry D. Adamson, Balquhairn, Alford (Cross),	6	0 0
2. Walter Scott, Glendronach, Huntly (Cross),	3	0 0
3. William A. Mitchell, Auchnagathle, Whitehouse, Aberdeen (Cross),	1	0 0
V. H. C., James Merson, Craigwillie, Huntly (Cross). H. C., George Strachan, Mains of Invererie, Ellon (Cross). C., George Shand, Ordens, Boyndie, Banff, "Malcolm" (Cross).		

Carry forward, L.1067 0 0

Brought forward, L.1067 0 0

SECTION 40. CROSS-BRED HEIFERS calved after 1st January 1873.

1. Henry. D. Adamson, Balquharn, Alford,	8 0 0
2. Henry D. Adamson, Balquharn, Alford,	4 0 0
3. James Reid, Greystone, Alford,	2 0 0
H. C., James Bruce, Inverquhomery, Longside.	

SECTION 41. CROSS-BRED HEIFERS calved after 1st January 1874.

1. Alexander Munro, Ord, Invergordon, "Maggie,"	6 0 0
2. James M ^c William, Stoneyton, Keith,	3 0 0
3. James Moir, Mains of Wardhouse, Insch, "Lovely Gem,"	1 0 0
H. C., Peter Bruce, Myreton, Insch, Aberdeen. C., Andrew Longmore, Rettie, Banff, "Annie."	

EXTRA CATTLE.

Very Highly Commended.

Polled Heifer, belonging to William M ^c Combie of Tillyfour, Whitehouse, Aberdeen,	Minor Gold Medal	L.3 15 0
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Highly Commended.

Polled Ox, belonging to James Reid, Greystone, Alford, N.B.	Silver Medal	0 16 0
Cross-bred Ox, belonging to the Earl of Aberdeen, Haddo House, Aberdeen,	Silver Medal	0 16 0

L.1096 7 0

CLASS II.—HORSES

FOR AGRICULTURAL PURPOSES.

SECTION 1. STALLIONS foaled before 1st January 1873.

1. David Riddell, Kilbowie, Duntocher, "Baron Keir,"	30 0 0
2. Andrew Gemmell, Caplaw, Neilston, "Gleniffer,"	29 0 0
3. David Riddell, Kilbowie, Duntocher, "Roving Boy,"	10 0 0
4. Peter Ferguson, Queen Street, Renfrew, "Young Clansman,"	5 0 0
Breeder of Best Stallion—Colonel Williamson of Lawers, Crieff,	0 16 0
V. H. C., William Mather, Thorn, Fenwick, "Paisley Jock." H. C., John Duncan Ardo, Methlie, "Lord Derby." C., Robert Andrew, Allans, Paisley, "Defiance."	

SECTION 2. ENTIRE COLTS foaled after 1st January 1873.

1. David Riddell, Kilbowie, Duntocher, "Luck's All,"	20 0 0
2. John Hendrie, Kirkwood, Coatbridge, "Disraeli,"	15 0 0
3. John Thomson, Blaiket, Crocketford, Dumfries, "Enterprise,"	10 0 0
4. Alexander Ewen, Whitehills, Banff, "Scottish Times,"	5 0 0
V. H. C., David Riddell, Kilbowie, Duntocher, "What Care I." H. C., Joseph Tait, Waulkmill, Elgin, "Johnny." C., John Whyte, Nether Craigends, Linwood, Paisley, "Craigends Prince."	

SECTION 3. ENTIRE COLTS foaled after 1st January 1874.

1. David Riddell, Kilbowie, Duntocher,	15 0 0
2. John Marr, Mill of Kingoodie, Old Meldrum, "The General,"	8 0 0
3. Robert Andrew, Allans, Paisley, "Boydston Boy,"	4 0 0
4. Archibald C. Brown, Gledstone, Bishopton,	2 0 0
V. H. C., Peter Ferguson, Queen Street, Renfrew, "Sir Colin." H. C., Alexander Burr, Tulloford, Old Meldrum. C., John Hendrie, Kirkwood, Coatbridge, "Derby."	

SECTION 4. ENTIRE COLTS foaled after 1st January 1875.

1. David Riddell, Kilbowie, Duntocher,	10 0 0
2. Robert Andrew, Allans, Paisley, "Young Defiance,"	6 0 0
3. George Duncan, Port-Elphinstone, Inverurie, "Time o' Day,"	4 0 0
4. Andrew Ralston, Glamis House, Glamis, "Doulach,"	2 0 0
V. H. C., John Hendrie, Kirkwood, Coatbridge, "Dunmore." H. C., Andrew Ralston, Glamis House, Glamis, "Hercules." C., Robert Walker, Montbleton, Banff, "Black Lorne."	

Carry forward, L.166 16 0

Brought forward, L.166 16 0

SECTION 5. MARES (with Foal at foot), foaled before 1st January 1873.

1. Alex. Buchanan, Garscadden Mains, New Kilpatrick, "Maggie,"	. . . . .	25	0	0
2. The Earl of Strathmore, Glamis Castle, Forfar, "Tibbie,"	. . . . .	15	0	0
3. Hugh Young, Killoch, Neilston, "Jean,"	. . . . .	10	0	0
4. W. H. Hardie, Borrowstoun Mains, Linlithgow, "Ranée,"	. . . . .	5	0	0
V. H. C., James Roberts, Lumgair, Stonehaven, "Bloom." H. C., Robert Walker, Montbleton, Banff, "Mally." C., Mrs Ann Sangster, Balnabreck, Brechin, "Jean."				

SECTION 6. MARES (in foal) foaled before 1st January 1873.

1. James M'Nab, Glenochil, Menstrie, "Princess,"	. . . . .	20	0	0
2. James Roberts, Lumgair, Stonehaven, "Brown Bess,"	. . . . .	10	0	0
3. James Laurence, Thornhill, Forres, "Maggie,"	. . . . .	5	0	0
4. John Thompson, Baillieknowe, Kelso, "Darling,"	. . . . .	3	0	0
V. H. C., John Calder, Muirton, Lossiemouth, "Fanny." H. C., Robert Hart Anderson, Burleigh, Milnathort, "Darling." C., Mrs Beattie, Dunnydeer, Insch, Aberdeen, "Jepp."				

SECTION 7. FILLIES foaled after 1st January 1873.

1. John Thompson, Baillieknowe, Kelso, "Kelso Maggie,"	. . . . .	10	0	0
2. The Earl of Strathmore, Glamis Castle, Forfar, "Flora,"	. . . . .	5	0	0
3. Henry D. Adamson, Balquharn, Alford, "Blossom,"	. . . . .	3	0	0
4. Mrs Jane Hay, South Ythsie, Tarves, "Meg,"	. . . . .	2	0	0
V. H. C., William Ironside, Clotrickford, Ellon, "Rance." H. C., James Lumsden, Braco, Keith, "May." C., Henry D. Adamson, Balquharn, Alford, "Ailsie."				

SECTION 8. FILLIES foaled after 1st January 1874.

1. John Anderson, Smithstown, Croy, Kilsyth, "Maggie,"	. . . . .	8	0	0
2. James Scott, St. Mary's, Orton, Fochabers, "Polly,"	. . . . .	4	0	0
3. Alexander Munro, Ord, Invergordon, "Rosy,"	. . . . .	2	0	0
4. James Sutor, Collie, Orton, Fochabers, "Rosebud,"	. . . . .	1	0	0
V. H. C., James Watt, Garbity, Fochabers, "Kate." H. C., James Skinner, Bethelnie, Old Meldrum, "Daly." C., James Skinner, Bethelnie, Old Meldrum, "Bet."				

SECTION 9. FILLIES foaled after 1st January 1875.

1. John M. Martin, Auchendennan Farm, Balloch, "Damsel,"	. . . . .	6	0	0
2. George Wilson, Whiteside, Alford, "Kate,"	. . . . .	4	0	0
3. George Watson, Edindiack, Huntly, "Jess,"	. . . . .	2	0	0
4. Alexander M. Ogilvie, Tillynaught, Portsoy, "Bess,"	. . . . .	1	0	0
V. H. C., James Skinner, Hillhead, Hilton, Woodside, Aberdeen, "Jess." H. C., James Merson, Craigwillie, Huntly, "Peg."				

SECTION 10. DRAUGHT GELDINGS foaled before 1st January 1873.

1. James Walker, St Ann Street, Glasgow, "Peacock,"	. . . . .	8	0	0
2. The Earl of Strathmore, Glamis Castle, Forfar, "Jolly,"	. . . . .	4	0	0
3. The Earl of Strathmore, Glamis Castle, Forfar, "Bob,"	. . . . .	2	0	0
4. James Asher & Sons, Schoolhill, Aberdeen, "Jamie,"	. . . . .	1	0	0
V. H. C., William Philip, Lofthillock, Inverurie, "Bob." H. C., Trustees of Oldmill Reformatory Farm, Aberdeen, "Prince." C., William Walker, Tillymaud, Uduy, "Prince."				

SECTION 11. DRAUGHT GELDINGS foaled after 1st January 1873.

1. Mrs Jane Hay, South Ythsie, Tarves, "Tim,"	6	0	0
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HUNTERS AND ROADSTERS.

SECTION 12. MARES or GELDINGS, suitable for Field, foaled before 1st January 1872.

1. George Davidson, 18 Regent Quay, Aberdeen, mare, "Hottentot,"	. . . . .	20	0	0
2. Henry Welsh, 13 Minto Street, Edinburgh, gelding, "Hardengreen,"	. . . . .	10	0	0
3. Major Ramsay of Barra, Straloch, Aberdeen, mare, "Countess,"	. . . . .	5	0	0

Carry forward, L.563 16 0

Brought forward, L.363 16 0

SECTION 13. MARES or GELDINGS, suitable for Carriage, foaled before 1st January 1872.

- | | | | |
|--|----|---|---|
| 1. Alexander O. Gill, Fairfield, Aberdeen, gelding, "Jack," | 20 | 0 | 0 |
| 2. Andrew F. Williamson, Standingstones, Dyce, Aberdeen, mare, "Casque," | 10 | 0 | 0 |

SECTION 14. MARES or GELDINGS, suitable as Hackneys or Roadsters, between 14 and 15 hands high.

- | | | | |
|--|---|---|---|
| 1. James P. S. Walker, Mountrieh, Dingwall, mare, "Duchess," | 8 | 0 | 0 |
| 2. John Meek, Whitburn, mare, "Maggie," | 4 | 0 | 0 |
| 3. Dr Fiddes, 154 Union Street, Aberdeen, mare, "Agnes," | 2 | 0 | 0 |

SECTION 15. STALLIONS, MARES, or GELDINGS, for Leaping.

- | | | | |
|--|----|---|---|
| 1. James Watt, Garbity, Fochabers, mare, "Black Bess," | 10 | 0 | 0 |
| 2. George Davidson, 18 Regent Quay, Aberdeen, mare, "Hottentot," | 5 | 0 | 0 |
| 3. John Taylor, Redcastle, Arbroath, mare, "Baffle," | 3 | 0 | 0 |

EXTRA HORSES.
Highly Commended.

- | | | | | |
|--|---------------|---|----|---|
| Thoroughbred Stallion, "General Blucher," belonging to Thomas Bland, Greystone, Alford, | Silver Medal, | 0 | 16 | 0 |
| Shetland Pony Stallion, "Blackbird," belonging to Henry Welsh, 13 Minto Street, Edinburgh, | Silver Medal, | 0 | 16 | 0 |
| Arab Stallion, "Posta," belonging to Alexander Baird of Urie, Stonehaven, | Silver Medal, | 0 | 16 | 0 |

Commended.

- | | | | | |
|---|----------------------|---|----|---|
| Carriage Mare, "Maria," belonging to R. O. Farquharson of Haughton, Alford, Aberdeen, | Medium Silver Medal, | 0 | 10 | 6 |
| Half-bred Gelding, "The Prince," belonging to Duncan Davidson of Tulloch, Dingwall, | Medium Silver Medal, | 0 | 10 | 6 |

PONIES.

First Prize Stallions at former Shows—Exhibited for Medium Gold Medal.

- | | | | |
|---|---|---|---|
| Inverness, 1874, when the property of the present Exhibitor—Miss Augusta Norton, Rannoch Lodge, Pitlochry, "Little Benjamin," | 6 | 2 | 0 |
|---|---|---|---|

SECTION 16. HIGHLAND STALLIONS, 14½ hands high and under.

- | | | | |
|---|---|---|---|
| 1. The Duke of Athole, K.T., Blair Castle, Blair Athole, "Glengarry," | 6 | 0 | 0 |
| 2. Duncan D. M.L. McLeod, Coulnoor, Inverness, "Glen," | 3 | 0 | 0 |
| 3. Alexander Baird of Urie, Stonehaven, "Urie," | 1 | 0 | 0 |

SECTION 17. HIGHLAND MARES or GELDINGS between 13 and 14½ hands high.

1. No award.
C., Thomas M'Bey, Auchronie, Kinellar, mare, "Polly."

SECTION 18. MARES or GELDINGS, between 13 and 14 hands high.

- | | | | |
|---|---|---|---|
| 1. Wm. Pyper, Hillhead, Pitfodels, Aberdeen, gelding, "Tom," | 6 | 0 | 0 |
| 2. Major Ramsay of Barra, Strathloch, Aberdeen, gelding, "Prince Imperial," | 3 | 0 | 0 |
| 3. Gavin T. Todd, Kinellar Lodge, Aberdeen, mare, "Jeanie," | 1 | 0 | 0 |
- C., James Bruce, Burnside, Fochabers, mare, "Jeanie." C., T. Leslie Melville Cartwright, Melville House, Ladybank, gelding, "Czar."

SECTION 19. MARES or GELDINGS between 12 and 13 hands high.

- | | | | |
|---|---|---|---|
| 1. Alexander Baird of Urie, Stonehaven, mare, "Skewball," | 6 | 0 | 0 |
| 2. James A. Gordon, Udale, Invergordon, mare, "Fairy," | 3 | 0 | 0 |

SECTION 20. MARES or GELDINGS, 12 hands and under.

- | | | | |
|---|---|---|---|
| 1. James Bruce, Burnside, Fochabers, mare, "Maggie," | 6 | 0 | 0 |
| 2. Peter Beveridge, Beath Villa, Aberdeen, mare, "Kate," | 3 | 0 | 0 |
| 3. Peter Beveridge, Beath Villa, Aberdeen, mare, "Flora," | 1 | 0 | 0 |
- C., John Taylor, Redcastle, Arbroath, gelding, "Jamie."

THOROUGHBRED STALLION.

- | | | | |
|--|----|---|---|
| Thomas Bland, Greystone, Alford, Aberdeenshire, "Blucher," | 50 | 0 | 0 |
|--|----|---|---|

L.524 7 0

CLASS III.—SHEEP.

CHEVIOT.

SECTION 1. TUPS above 1 Shear.

1. James Brydon, Kinnelhead, Moffat,	12 0 0
2. Thomas Welsh, Ericstane, Moffat,	8 0 0
3. John A. Johnstone, Archbank, Moffat,	4 0 0
4. James Brydon, Kinnelhead, Moffat,	2 0 0
V. H. C., Thomas Welsh, Ericstane, Moffat. H. C., Herbert Brydon, Thirlstane Hope, Selkirk. C., James Brydon, Kinnelhead, Moffat.	

SECTION 2. SHEARLING TUPS.

1. John A. Johnstone, Archbank, Moffat,	12 0 0
2. John A. Johnstone, Archbank, Moffat,	8 0 0
3. John A. Johnstone, Archbank, Moffat,	4 0 0
4. James Johnstone, Capplehill, Moffat	2 0 0
V. H. C., John A. Johnstone, Archbank, Moffat. H. C., James Johnstone, Hunterheck, Moffat. C., Thomas Welsh, Ericstane, Moffat.	

SECTION 3. Pens of 5 EWES above 1 Shear, with Lambs.

1. James Brydon, Kinnelhead, Moffat,	10 0 0
2. Thomas Elliot, Hindhope, Jedburgh,	5 0 0
3. James Archibald, Glengelt, Lauder,	2 0 0

LAMBS.

1. Thomas Elliot, Hindhope, Jedburgh,	2 0 0
2. James Brydon, Kinnelhead, Moffat.	1 0 0
V. H. C., James Archibald, Glengelt, Lauder.	

SECTION 4. Pens of 5 SHEARLING EWES or GIMMERS.

1. James Archibald, Glengelt, Lauder,	10 0 0
2. Thomas Elliot, Hindhope, Jedburgh,	5 0 0
3. David Mundell, Gollanfield, Fort-George Station,	2 0 0
V. H. C., David Mundell, Gollanfield, Fort-George Station.	

BLACKFACED.

SECTION 5. TUPS above 1 shear.

1. John Archibald, Overshiels, Stow,	12 0 0
2. John Archibald, Overshiels, Stow,	8 0 0
3. John Archibald, Overshiels, Stow,	4 0 0
4. James Greenshields, West Town, Lesmahagow,	2 0 0
V. H. C., James Greenshields, West Town, Lesmahagow. H. C., John Archibald, Overshiels, Stow.	

SECTION 6. SHEARLING TUPS.

1. James Greenshields, West Town, Lesmahagow,	12 0 0
2. Patrick Melrose, West Loch, Eddlestone,	8 0 0
3. James Greenshields, West Town, Lesmahagow,	4 0 0
4. James Greenshields, West Town, Lesmahagow,	2 0 0
V. H. C., John Archibald, Overshiels, Stow.	

SECTION 7. Pens of 5 EWES above 1 Shear, with Lambs.

1. John Archibald, Overshiels, Stow,	10 0 0
2. James M'Pherson, Clunas, Cawdor, Nairn,	5 0 0
3. Do., do.,	2 0 0

LAMBS.

1. James M'Pherson, Clunas, Cawdor, Nairn,	2 0 0
2. Do., Do.,	1 0 0
V. H. C., John Archibald, Overshiels, Stow,	

SECTION 8. Pens of 5 SHEARLING EWES or GIMMERS.

1. John Archibald, Overshiels, Stow,	10 0 0
2. James Johnstone Currie, Yorkston, Gorebridge,	5 0 0
3. Patrick Melrose, West Loch, Eddlestone,	2 0 0
H. C., James M'Pherson, Clunas, Cawdor, Nairn.	

 Carry forward, L.178 0 0

Brought forward, L 178 0 0

BORDER LEICESTER.

SECTION 9. TUPS above 1 shear.

1. Thomas Forster, jun., Ellingham, Chathill, Northumberland,	. . . . .	12 0 0
2. Richard Tweedie, The Forest, Catterick,	. . . . .	8 0 0
3. Do. do.,	. . . . .	4 0 0
4. William Purves, Thurdistoft, Thurso,	. . . . .	2 0 0
V. H. C., The Earl of Dalhousie, Pannure, Carnoustie. C., John Taylor, Redcastle, Arbroath.		

SECTION 10. SHEARLING TUPS.

1. Andrew Smith, Castlemains, Gifford,	. . . . .	12 6 0
2. James Clark, Oldhamstocks, Mains, Cockburnspath,	. . . . .	8 0 0
3. A. Peterkin Hope, yr. of Bordlands, Noblehouse,	. . . . .	4 0 0
4. James Clark, Oldhamstocks Mains, Cockburnspath,	. . . . .	2 0 0
V. H. C., Thomas Ferguson, Kinnochtry, Coupar-Angus. H. C., James Clark, Oldhamstocks Mains, Cockburnspath. C. Andrew Smith, Castlemains, Gifford.		

SECTION 11. Pens of 5 EWES above 1 shear.

1. Richard Tweedie, The Forest, Catterick,	. . . . .	10 0 0
2. The Earl of Dalhousie, Pannure, Carnoustie,	. . . . .	5 0 0
3. Garden Duff Dunbar of Hempriggs, Aekergill Tower, Wick,	. . . . .	2 0 0

SECTION 12. Pens of 5 SHEARLING EWES or GIMMERS.

1. James Clark, Oldhamstocks Mains, Cockburnspath,	. . . . .	10 0 0
2. The Marquis of Tweeddale, K.T., Yester,	. . . . .	5 0 0
3. Richard Tweedie, The Forest, Catterick,	. . . . .	2 0 0
V. H. C. Richard Tweedie, The Forest, Catterick. C., John Hill, Carlwrie, Crannond Bridge.		

LEICESTER.

SECTION 13. TUPS of any age.

1. Eric Sutherland, Tannachie House, Fochabers,	. . . . .	8 0 0
2. Do. do.,	. . . . .	4 0 0
3. Do. do.,	. . . . .	2 0 0

SECTION 14. Pens of 5 EWES of any age, or GIMMERS.

1. Eric Sutherland, Tannachie House, Fochabers,	. . . . .	6 0 0
2. Do. do.,	. . . . .	3 0 0

COTSWOLD.

SECTION 15. TUPS of any age.

1. John Gibson, Woolmet, Dalkeith,	. . . . .	8 0 0
2. Do. do.,	. . . . .	4 0 0
3. Do. do.,	. . . . .	2 0 0
H. C., The Earl of Crawford and Balcarres, Dunecht, Aberdeenshire		

SECTION 16. Pens of 5 EWES of any age, or GIMMERS.

1. John Gibson, Woolmet, Dalkeith,	. . . . .	6 0 0
2. Do. do.,	. . . . .	3 0 0
3. The Earl of Crawford and Balcarres, Dunecht, Aberdeenshire,	. . . . .	1 0 0

LINCOLN.

SECTION 17. TUPS of any age.

1. John Bell Irving of Whitehill, Lockerbie,	. . . . .	8 0 0
2. Do. do.,	. . . . .	4 0 0
3. Do. do.,	. . . . .	2 0 0
V. H. C., John Bell Irving of Whitehill, Lockerbie.		

SECTION 18. Pens of 5 EWES of any age, or GIMMERS.

1. John Bell Irving of Whitehill, Lockerbie,	6 0 0
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Carry forward, L 331 0 0

	Brought forward,	L 331 0 0
SOUTHDOWN.		
SECTION 19. TUPS of any age.		
1. Henry Gordon of Manar, Inverurie,	. . . . .	8 0 0
2. Do. do.,	. . . . .	4 0 0
3. John Leith Ross of Arnage, Ellon,	. . . . .	2 0 0
SECTION 20. Pens of 5 EWES of any age, or GIMMERS.		
1. Henry Gordon of Manar, Inverurie,	. . . . .	6 0 0
2. John Leith Ross of Arnage, Ellon,	. . . . .	3 0 0
3. Do. do.,	. . . . .	1 0 0
SHROPSHIRE.		
SECTION 21. TUPS of any age.		
1. Lord Chesham, Latimer, Chesham,	. . . . .	8 0 0
2. Do. do. do.,	. . . . .	4 0 0
3. John Gibson, Woolmet, Dalkeith,	. . . . .	2 0 0
V. H. C., John Gibson, Woolmet, Dalkeith.		
SECTION 22. Pens of 5 EWES of any age, or GIMMERS.		
1. John Gibson, Woolmet, Dalkeith,	. . . . .	6 0 0
2. Do. do. do.,	. . . . .	3 0 0
3. Lord Polwarth, Humble, Upper Keith,	. . . . .	1 0 0
EXTRA SECTIONS.		
SECTION 23. Pens of 5 CHEVIOT WETHERS, not above 3 Shear.		
1. The Duke of Sutherland, K.G., Dunrobin,	. . . . .	4 0 0
2. David Welsh, Tillytoghills, Fettercairn,	. . . . .	2 0 0
SECTION 24. Pens of 5 BLACKFACED WETHERS, not above 4 Shear.		
1. Thomas Roy, Ballendrick, Bridge of Earn, Perth,	. . . . .	4 0 0
2. J. & W. Martin, New Market, Aberdeen,	. . . . .	2 0 0
V. H. C., J. & W. Martin, New Market, Aberdeen.		
SECTION 25. Pens of 5 WETHER HOGGS of any Cross, not above 1 Shear.		
1. Eric Sutherland, Tannachie House, Fochabers,	. . . . .	4 0 0
2. Do. do. do.,	. . . . .	2 0 0
V. H. C., James Bruce, Inverquhomery, Longside. C., Lord Polwarth, Humble, Upper Keith.		
		<hr/> <hr/> L.397 0 0
CLASS IV.—SWINE.		
LARGE BREED.		
SECTION 1. BOARS.		
1. R. E. Duckering, Northorpe, Kirton Lindsey,	. . . . .	L.8 0 0
2. Jacob Dove, Hambrook House, Hambrook, Bristol,	. . . . .	4 0 0
3. John Moir & Son, Garthdee, Aberdeen,	. . . . .	2 0 0
SECTION 2. SOWS.		
1. Jacob Dove, Hambrook House, Hambrook, Bristol,	. . . . .	6 0 0
2. R. E. Duckering, Northorpe, Kirton Lindsey,	. . . . .	3 0 0
3. John Moir & Son, Garthdee, Aberdeen,	. . . . .	1 0 0
V. H. C., William Macdonald, Woodlands, Perth. C., John Moir & Son, Garthdee, Aberdeen.		
SECTION 3. Pens of 3 PIGS, not above 8 months old.		
1. R. E. Duckering, Northorpe, Kirton Lindsey,	. . . . .	4 0 0
2. Jacob Dove, Hambrook House, Hambrook, Bristol,	. . . . .	2 0 0
3. John Moir & Son, Garthdee, Aberdeen,	. . . . .	1 0 0
		<hr/> <hr/> L.31 0 0
	{Carry forward,	L.31 0 0

Brought forward, L.31 0 0

BERKSHIRE.

SECTION 4. BOARS.

1. Jacob Dove, Hambrook House, Hambrook, Bristol,	8 0 0
2. John Blaikie, Carron Lodge, Stonehaven,	4 0 0
3. The Earl of Strathmore, Glamis Castle, Forfar	2 0 0

SECTION 5. SOWS.

1. R. E. Duckering, Northorpe, Kirkton Lindsey,	6 0 0
2. Jacob Dove, Hambrook House, Hambrook, Bristol,	3 0 0
3. Benjamin St. John Ackers, Prinknash Park, Painswick, Gloucestershire,	1 0 0
H. C., Benjamin St. John Ackers, Prinknash Park, Painswick. C., Lord Kinnaird, K.T., Ressie Priory, Inchture.	

SECTION 6. Pens of 3 PIGS, not above 8 months old.

1. John Moir & Son, Garthdee, Aberdeen,	4 0 0
2. Jacob Dove, Hambrook House, Hambrook, Bristol,	2 0 0

SMALL BREED.

SECTION 7. BOARS.

1. R. E. Duckering, Northorpe, Kirton Lindsey,	8 0 0
2. Do. do. do.,	4 0 0
3. Jacob Dove, Hambrook House, Hambrook, Bristol,	2 0 0
C., John Moir & Son, Garthdee, Aberdeen.	

SECTION 8. SOWS.

1. The Duke of Buccleuch, K.G., Dalkeith Park, Dalkeith,	6 0 0
2. R. E. Duckering, Northorpe, Kirkton Lindsey,	3 0 0
3. Do. do. do.,	1 0 0
V. H. C., John Moir & Son, Garthdee, Aberdeen. H. C., Jacob Dove, Hambrook House, Hambrook, Bristol.	

SECTION 9. Pens of 3 PIGS, not above 8 months old.

1. R. E. Duckering, Northorpe, Kirkton Lindsey,	4 0 0
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L.89 0 0

CLASS V.—POULTRY.

SECTION 1. DORKING, Silver Grey—Cock.

1. George Black, Mill of Craibstone, Newhills,	L.1 0 0
2. William Mitchell, Meikle Dens, Longside, Aberdeen,	0 10 0

SECTION 2. DORKING, Silver Grey—2 Hens.

1. William Mitchell, Meikle Dens, Longside, Aberdeen,	1 0 0
2. James Mitchell, Caiesmill, Blackburn, Aberdeen,	0 10 0

SECTION 3. DORKING, Silver Grey—Cockerel.

1. Mrs Geo. Armitstead, Inchmartine, Inchture,	1 0 0
2. James Ritchie, Hill of Udney, Udney,	0 10 0

SECTION 4. DORKING, Silver Grey—2 Pullets.

1. Mrs George Armitstead, Inchmartine, Inchture,	1 0 0
2. James Annand, Ironmonger, Keith,	0 10 0

SECTION 5. DORKING, Coloured—Cock.

1. Adam Allan, Udney Castle, Aberdeen,	1 0 0
2. William Anderson, Broadfield, Keith,	0 10 0

SECTION 6. DORKING, Coloured—2 Hens.

1. Mrs Grant of Glengrant, Rothies,	1 0 0
2. Charles Duncan, Fochabers,	0 10 0

SECTION 7. DORKING, Coloured—Cockerel.

1. James McNab, Glenochil, Menstrie,	1 6 0
2. William Snowie, Monymusk, Aberdeen,	0 10 0

Carry forward, L.10 10 0

	Brought forward,	L.10 10 0
SECTION 8. DORKING, Coloured—2 Pullets.		
1. Henry Gordon of Manar, Inverurie,	1 0 0
2. Mrs George Armitstead, Inchmartine, Inchture,	0 10 0
SECTION 9. COCHIN-CHINA—Cock.		
1. Thomas Bruce, Busby, Glasgow,	1 0 0
2. Mrs Walter Steven, 4 Academy Square, Montrose,	0 10 0
SECTION 10. COCHIN-CHINA—2 Hens.		
1. Mrs Walter Steven, 4 Academy Square, Montrose,	1 0 0
2. Thomas Bruce, Busby, Glasgow,	0 10 0
SECTION 11. COCHIN-CHINA—Cockerel.		
1. Alexander Thomson, Mains, Tillicoultry,	1 0 0
2. William Fraser, 6 Jesamine Terrace, Aberdeen,	0 10 0
SECTION 12. COCHIN-CHINA—2 Pullets.		
1. Mrs James Davidson, Star Hotel, Montrose,	1 0 0
2. William Fraser, 6 Jesamine Terrace, Aberdeen,	0 10 0
SECTION 13. BRAHMAPOOTRA—Cock.		
1. Robert Bruce, Busby, Glasgow	1 0 0
2. William Anderson, Broadfield, Keith,	0 10 0
SECTION 14. BRAHMAPOOTRA—2 Hens.		
1. John Sandeman, 15 Strathmartine Road, Dundee,	1 0 0
2. John Young, Hailes Cottage, Slateford,	0 10 0
SECTION 15. BRAHMAPOOTRA—Cockerel.		
1. The Rev. George Wilson, Fetternear, Inverurie,	1 0 0
2. Miss E. Russell, Woodside, Hamilton,	0 10 0
SECTION 16. BRAHMAPOOTRA—2 Pullets.		
1. John Sandeman, 15 Strathmartine Road, Dundee,	1 0 0
2. John Edmonston, Seafield, Aberdeen,	0 10 0
SECTION 17. SPANISH—Cock.		
1. Mrs Gracie, Colinton,	1 0 0
2. James Ogg, 100½ John Street, Aberdeen,	0 10 0
SECTION 18. SPANISH—2 Hens.		
1. James McNab, Glenochil, Menstrie,	1 0 0
2. John Duncan, Scotsmill, Blackburn, Aberdeen.	0 10 0
SECTION 19. SPANISH—Cockerel.		
1. James Norval, Hawkhill Lodge, Alloa,	1 0 0
2. John Duncan, Scotsmill, Blackburn, Aberdeen,	0 10 0
SECTION 20. SPANISH—2 Pullets.		
1. James Norval, Hawkhill Lodge, Alloa,	1 0 0
2. John Duncan, Scotsmill, Blackburn, Aberdeen,	0 10 0
SECTION 21. SCOTCH GREY—Cock.		
1. Alexander Hamilton, Braidwood Tile Works, Carluke,	1 0 0
SECTION 22. SCOTCH GREY—2 Hens.		
1. Alexander Hamilton, Braidwood Tile Works, Carluke,	1 0 0
SECTION 23. SCOTCH GREY—Cockerel.		
1. Alexander Hamilton, Braidwood Tile Works, Carluke,	1 0 0
2. John Young, Hailes Cottage, Slateford	0 10 0
Carry forward,	L.33 10 0	

	Brought forward,	L.33 10 0
SECTION 24. SCOTCH GREY—2 Pullets.		
1. Alexander Hamilton, Braidwood Tile Works, Carlisle,	1 0 0	
2. Thomas Lawrie, Linlithgow,	0 10 0	
SECTION 25. HAMBURG, Pencilled—Cock.		
1. John Fleming, Meadow Bank, Strathaven,	1 0 0	
2. Robert Ogg, 169½ John Street, Aberdeen,	0 10 0	
SECTION 26. HAMBURG, Pencilled—2 Hens.		
1. John Fleming, Meadow Bank, Strathaven,	1 0 0	
2. Robert Ogg, 169½ John Street, Aberdeen,	0 10 0	
SECTION 27. HAMBURG, Pencilled—Cockerel.		
1. James Brand, Bonnybridge, Denny,	1 0 0	
2. Robert Mellis, Goodhope, Auchmill, Aberdeen,	0 10 0	
SECTION 28. HAMBURG, Pencilled—2 Pullets.		
1. Peter Campbell, Oldwhat, New Deer,	1 0 0	
2. Robert Mellis, Goodhope, Auchmill, Aberdeen,	0 10 0	
SECTION 29. HAMBURG, Spangled—Cock.		
1. David Galbraith, Busby, Glasgow,	1 0 0	
2. J. M. Campbell, Bonnykelly, New Deer,	0 10 0	
SECTION 30. HAMBURG, Spangled—2 Hens.		
1. George Low, South Kinloch Street, Carnoustie,	1 0 0	
2. D. G. Forbes of Millburn, Inverness,	0 10 0	
SECTION 31. HAMBURG, Spangled—Cockerel.		
1. John Morrison, Mill Street, Alloa,	1 0	
2. George Beattie, 33 Hutcheon Street, Aberdeen,	0 10	
SECTION 32. HAMBURG, Spangled—2 Pullets.		
1. J. M. Campbell, Bonnykelly, New Deer,	1 0 0	
2. John Morrison, Mill Street, Alloa,	0 10 0	
SECTION 33. POLISH—Cock.		
1. Mrs Jane Henderson, 4 Cuparstone Place, Aberdeen,	1 0 0	
SECTION 34. POLISH—2 Hens.		
1. John Taylor, 157 High Street, Montrose,	1 0 0	
SECTION 35. POLISH—Cockerel.—No Entry.		
SECTION 36. POLISH—2 Pullets.—No Entry.		
SECTION 37. GAME, Black or Brown Reds—Cock.		
1. William Webster, Denburn, Kirkealdy,	1 0 0	
2. David Harley, Rosebank House, Bonnington, Edinburgh,	0 10 0	
SECTION 38. GAME, Black or Brown Reds—1 Hen.		
1. H. W. Hutchison, Braehead, Kirkealdy,	1 0 0	
2. William Webster, Denburn, Kirkealdy,	0 10 0	
SECTION 39. GAME, Black or Brown Reds—Cockerel.		
1. William Chambers, Leslie, Fife,	1 0 0	
2. William Webster, Denburn, Kirkealdy,	0 10 0	
SECTION 40. GAME, Black or Brown Reds—1 Pullet.		
1. William Webster, Denburn, Kirkealdy,	1 0 0	
2. William Chambers, Leslie, Fife,	0 10 0	
SECTION 41. GAME, Duckwings, or any other Variety—Cock.		
1. David Harley, Rosebank House, Bonnington, Edinburgh,	1 0 0	
2. David Harley, Rosebank House, Bonnington, Edinburgh,	0 10 0	
	Carry forward,	1.53 10 0

	Brought forward,	L.56 10 0
SECTION 42. GAME, Duckwings, or any other Variety—1 Hen.		
1. David Harley, Rosebank House, Bonnington, Edinburgh, . . . . .	. . . . .	1 0 0
2. David Harley, Rosebank House, Bonnington, Edinburgh, . . . . .	. . . . .	0 10 0
SECTION 43. GAME, Duckwings, or any other Variety—Cockerel.— Not forward.		
SECTION 44. GAME, Duckwings, or any other Variety—1 Pullet.		
1. David Harley, Rosebank House, Bonnington, Edinburgh, . . . . .	. . . . .	1 0 0
2. William A. Swan, Leslie, Fife, . . . . .	. . . . .	0 10 0
SECTION 45. BANTAMS, Game—Cock.		
1. Robert Brownlie, Bankslee, Kirkcaldy, . . . . .	. . . . .	1 0 0
2. Robert Brownlie, Bankslee, Kirkcaldy, . . . . .	. . . . .	0 10 0
SECTION 46. BANTAMS, Game—1 Hen.		
1. Robert Brownlie, Bankslee, Kirkcaldy, . . . . .	. . . . .	1 0 0
2. Alexander Frew, Sinclairtown, Kirkcaldy, . . . . .	. . . . .	0 10 0
SECTION 47. BANTAMS, Game—Cockerel.		
1. Robert Brownlie, Bankslee, Kirkcaldy, . . . . .	. . . . .	1 0 0
2. Robert Brownlie, Bankslee, Kirkcaldy, . . . . .	. . . . .	0 10 0
SECTION 48. BANTAMS, Game—1 Pullet.		
1. Robert Brownlie, Bankslee, Kirkcaldy, . . . . .	. . . . .	1 0 0
2. Robert Brownlie, Bankslee, Kirkcaldy, . . . . .	. . . . .	0 10 0
SECTION 49. BANTAMS, Sebright—Cock.		
1. Miss Robina Frew, Sinclairtown, Kirkcaldy, . . . . .	. . . . .	1 0 0
2. Miss Bessie P. Frew, Sinclairtown, Kirkcaldy, . . . . .	. . . . .	0 10 0
SECTION 50. BANTAMS, Sebright—2 Hens.		
1. Miss Rachel C. Frew, Sinclairtown, Kirkcaldy, . . . . .	. . . . .	1 0 0
2. Robert E. Frew, Sinclairtown, Kirkcaldy, . . . . .	. . . . .	0 10 0
SECTION 51. BANTAMS, Sebright—Cockerel.		
1. Miss Jane M. Frew, Sinclairtown, Kirkcaldy, . . . . .	. . . . .	1 0 0
SECTION 52. BANTAMS, Sebright—2 Pullets.		
1. Alexander Frew, Sinclairtown, Kirkcaldy, . . . . .	. . . . .	1 0 0
SECTION 53. BANTAMS—Any other variety—Cock.		
1. J. D. Donald, 93 Bridge Street, Montrose, . . . . .	. . . . .	1 0 0
2. John Taylor, 157 High Street, Montrose, . . . . .	. . . . .	0 10 0
SECTION 54. BANTAMS—Any other variety—2 Hens.		
1. J. D. Donald, 93 Bridge Street, Montrose, . . . . .	. . . . .	1 0 0
2. Miss Bessie P. Frew, Sinclairtown, Kirkcaldy, . . . . .	. . . . .	0 10 0
SECTION 55. BANTAMS—Any other variety—Cockerel.		
1. Miss Jane M. Frew, Sinclairtown, Kirkcaldy, . . . . .	. . . . .	1 0 0
2. J. D. Donald, 93 Bridge Street, Montrose, . . . . .	. . . . .	0 10 0
SECTION 56. BANTAMS—Any other variety—2 Pullets.		
1. Alexander Frew, Sinclairtown, Kirkcaldy, . . . . .	. . . . .	1 0 0
2. J. D. Donald, 93 Bridge Street, Montrose, . . . . .	. . . . .	0 10 0
SECTION 57. POULTRY—Any other Pure Breed—Cock.		
1. John B. Brown, The Cottage, Gilmerton, Liberton, Edinburgh, . . . . .	. . . . .	1 0 0
2. George Shewan, 79 Spittal, Aberdeen, . . . . .	. . . . .	0 10 0
SECTION 58. POULTRY—Any other Pure Breed—2 Hens.		
1. John B. Brown, The Cottage, Gilmerton, Liberton, Edinburgh, . . . . .	. . . . .	1 0 0
2. John B. Brown, The Cottage, Gilmerton, Liberton, Edinburgh, . . . . .	. . . . .	0 10 0
SECTION 59. POULTRY—Any other Pure Breed—Cockerel.		
1. David Lonie, jun., 57 Queen Street, Aberdeen, . . . . .	. . . . .	1 0 0
2. William Massie, Lower Middlefield, Woodside, Aberdeen, . . . . .	. . . . .	0 10 0
	Carry forward,	L.81 0 0

		Brought forward,	L.81	0	0
SECTION 60. POULTRY—Any other Pure Breed—2 Pullets.					
1.	William Massie, Lower Middlefield, Woodside, Aberdeen,	.	.	.	1 0 0
2.	David Lonie, jun., 57 Queen Street, Aberdeen,	.	.	.	0 10 0
SECTION 61. DUCKS—White Aylesbury—Drake.					
1.	James Mitchell, Caiesmill, Blackburn, Aberdeen,	.	.	.	1 0 0
2.	William Anderson, Broadfield, Keith,	.	.	.	0 10 0
SECTION 62. DUCKS—White Aylesbury—2 Ducks.					
1.	James Mitchell, Caiesmill, Blackburn, Aberdeen,	.	.	.	1 0 0
2.	Thomas Aitken, Laigh Burn-o'-Need, Sorn, Ayrshire,	.	.	.	0 10 0
SECTION 63. DUCKS—White Aylesbury—Drake (Young).					
1.	George Bruce, Keig, Whitehouse, Aberdeen,	.	.	.	1 0 0
SECTION 64. DUCKS—White Aylesbury—2 Ducklings.					
1.	George Bruce, Keig, Whitehouse, Aberdeen,	.	.	.	1 0 0
SECTION 65. DUCKS—Rouen—Drake.					
1.	Lady Gladstone of Fasque, Laurencekirk,	.	.	.	1 0 0
2.	William Anderson, Broadfield, Keith,	.	.	.	0 10 0
SECTION 66. DUCKS—Rouen—2 Ducks.					
1.	William McCartney, Busby Print Works, Busby,	.	.	.	1 0 0
2.	Alexander Vallentine, Blackburn, Aberdeen,	.	.	.	0 10 0
SECTION 67. DUCKS—Rouen, Drake (Young).					
1.	William McCartney, Busby Print Works, Busby,	.	.	.	1 0 0
2.	William Hart, Kirkland, Auchterarder,	.	.	.	0 10 0
SECTION 68. DUCKS—Rouen—2 Ducklings.					
1.	William Hart, Kirkland, Auchterarder,	.	.	.	1 0 0
2.	Henry Gordon of Manar, Inverurie,	.	.	.	0 10 0
SECTION 69. DUCKS—Any other Pure Breed—Drake.					
1.	Miss Augusta Norton, Rannoch Lodge, Pitlochry,	.	.	.	1 0 0
2.	Miss Augusta Norton, Rannoch Lodge, Pitlochry,	.	.	.	0 10 0
SECTION 70. DUCKS—Any other Pure Breed—2 Ducks.					
1.	Miss Augusta Norton, Rannoch Lodge, Pitlochry,	.	.	.	1 0 0
SECTION 71. DUCKS—Any other Pure Breed—Drake (Young).—No Entry.					
SECTION 72. DUCKS—Any other Pure Breed—2 Ducklings.—No Entry.					
SECTION 73. TURKEYS—Black Norfolk—Cock.					
1.	Andrew Mitchell, East Kerse Mains, Bo'ness,	.	.	.	1 0 0
2.	William Anderson, Broadfield, Keith,	.	.	.	0 10 0
SECTION 74. TURKEYS—Black Norfolk—2 Hens.					
1.	Andrew Mitchell, East Kerse Mains, Bo'ness,	.	.	.	1 0
SECTION 75. TURKEYS—Black Norfolk—Cock (Poult).—No Award.					
SECTION 76. TURKEYS—Black Norfolk—2 Hens (Poults).—Not forward.					
SECTION 77. TURKEYS—Any other Breed—Cock.					
1.	Miss Augusta Norton, Rannoch Lodge, Pitlochry,	.	.	.	1 0 0
2.	Lady Gladstone of Fasque, Laurencekirk,	.	.	.	0 10 0

Carry forward, L.100 0 0

	Brought forward,	L100 0 0
SECTION 78. TURKEYS—Any other Breed—2 Hens.		
1. Miss Augusta Norton, Rannoeh Lodge, Pitlochry,	1 0 0
2. Lady Gladstone of Fasque, Laurencekirk,	0 10 0
SECTION 79. TURKEYS—Any other Breed—Cock (Poult).		
1. Lady Gladstone of Fasque, Laurencekirk,	1 0 0
2. William Hart, Kirkland, Auchterarder,	0 10 0
SECTION 80. TURKEYS—Any other Breed—2 Hens (Poults).		
1. Lady Gladstone of Fasque, Laurencekirk,	1 0 0
2. T. L. M. Cartwright, Melville House, Ladybank,	0 10 0
SECTION 81. GEESE—Grey Toulouse—Gander.		
1. Henry Gordon of Manar, Inverurie,	1 0 0
SECTION 82. GEESE—Grey Toulouse—2 Geese.		
1. Henry Gordon of Manar, Inverurie,	1 0 0
SECTION 83. GEESE—Grey Toulouse—Gander (Young).		
1. Henry Gordon of Manar, Inverurie,	1 0 0
2. George Bruce, Keig, Whitehouse, Aberdeen,	0 10 0
SECTION 84. GEESE—Grey Toulouse—2 Goslings.		
1. Henry Gordon of Manar, Inverurie,	1 0 0
2. George Bruce, Keig, Whitehouse, Aberdeen,	0 10 0
SECTION 85. GEESE—Embsden—Gander.—No Entry.		
SECTION 86. GEESE—Embsden—2 Geese.—No Entry.		
SECTION 87. GEESE—Embsden, Gander (Young).—No Entry.		
SECTION 88. GEESE—Embsden, 2 Goslings.—No Entry.		
SECTION 89. GEESE—Any other Pure Breed—Gander.		
1. D. G. Forbes of Millburn, Inverness,	1 0 0
2. D. G. Forbes of Millburn, Inverness,	0 10 0
SECTION 90. GEESE—Any other Pure Breed—2 Geese.		
1. D. G. Forbes of Millburn, Inverness,	1 0 0
2. D. G. Forbes of Millburn, Inverness,	0 10 0
SECTION 91. GEESE—Any other Pure Breed Gander (Young).		
1. D. G. Forbes of Millburn, Inverness,	1 0 0
SECTION 92. GEESE—Any other Pure Breed—2 Goslings.		
1. D. G. Forbes of Millburn, Inverness,	1 0 0
2. D. G. Forbes of Millburn, Inverness,	0 10 0
		L.115 0 0

CLASS VII.—IMPLEMENTS.

G. W. Murray & Co., Banff Foundry, Banff, for Thrashing Machine, L.10 0 0

Silver Medals were awarded to the following:—

1. Aveling & Porter, Rochester, for Agricultural Locomotive Engine, of Eight Horse Power, (nominal), invented by Thomas Aveling.
2. Henry Pooley & Son, 113 West Nile Street, Glasgow, for Patent Three Ton Self-Contained Agricultural Cart Weighing Machine.
3. Wurr & Lewis, 16 Walbrook, London, for New Patent Hand-Power Circular and Band Sawing Machine, &c.
4. Clayton & Shuttleworth, Lincoln, for Differential Gearing for Traction Engine.

Medium Silver Medals to:—

1. Thomas Bradford & Co., Salford, Manchester, and London, for New Patent Potato Washers.
2. E. H. Griffen, South Duffield, Selby, Yorks, for Patent Potato Separator, exhibited by Penny & Co. (Limited), Lincoln.
3. John Richardson, London Road, Carlisle, for Winnowing Machine.
4. Carruthers & Allan, Dumfries and Glasgow, for Improved Sheep Dipping Bath.
5. Shearer Brothers, Meybank Works, Turriff, for Foot-Power Thrashing Machine.
6. Walker, Fyfe, & Co., Aberdeen, for Patent Columnar Valve Hydraulic Ram.
7. James Keith, Gas and Water Engineer, Arbroath, for Hydraulic Rams for Raising Water.

7 Medium Silver Medals, L.3. 13s. 6d.

Minor Silver Medals to:—

1. Llewellins & James, 28 Bath Street, Glasgow, for General Collection.
2. Henry Pooley & Son, 113 West Nile Street, Glasgow, for General Collection.
3. John G. Rollins & Co., Old Swan Wharf, London Bridge, London, for General Collection.
4. Picklesy, Sims, & Co. (Limited), Bedford Foundry, Leigh, for Collection.
5. Ben. Reid & Co., Bon-Accord Works, Aberdeen, for Collection.
6. Richmond & Chandler, Salford, Manchester, for Collection.
7. J. Sellar & Sons, Elgin, for Collection.
8. Auchinachie & Simpson, Keith, for Collection.
9. Robert Boyle & Son, 100 Mitchell Street, Glasgow, for Collection.
10. John Doe, Errol, for Collection.
11. Thomas Gibson & Son, Bainfield Iron and Wire Works, Edinburgh, for Collection.
12. John Gray & Co., Uddingston Iron Works, Uddingston, Glasgow, for Collection.
13. Harper & Co., Aberdeen, for Collection.
14. Haughton & Thompson, Carlisle, for Collection.
15. Alexander Jack & Sons, Maybole, for Collection.
16. G. W. Murray & Co., Banff, for Collection.
17. T. Pirlie & Co., Kinnmundy, Longside, Aberdeenshire, for Collection.
18. George Sellar & Son, Huntly, for Collection.
19. David Whitecross, Banff, for Common Swing and Drill Plough combined.
20. F. Murrison, Ittlaw, for One-way Plough, exhibited by David Whitecross, Banff.

29 Minor Silver Medals, L.6.

ABSTRACT OF PREMIUMS.

Cattle,	L.1096	7	0
Horses,	524	7	0
Sheep,	397	0	0
Swine,	89	0	0
Poultry,	115	0	0
Implements,	22	17	6
	<hr/>		
	L.2244	11	6

LIST OF JUDGES.

SHORTHORN.—Richard Chaloner, Kingsfort, Monaylty, Ireland; H. Chandos Pole Gell, Hopton Hall, Wirksworth; Andrew Mitchell, Alloa.

POLLED ANGUS OR ABERDEEN.—George Gordon, Tullochallum, Dufftown; James Reid, Grey-stone, Alford; William Whyte, Spott, Kirriemuir.

GALLOWAY.—Thomas Gibbons, 24 Chiswick Street, Carlisle; James Grierson, Kirkland, Haugh of Urr.

AYRESHIRE.—George Crawford, Iligh Knowe Glass, East Kilbride; William Fleming, Tillechewan, Alexandria; George Pender, 5 Winton Terrace, Crosshill, Glasgow.

HIGHLAND.—Charles Howatson of Dornel, Mauchline; Duncan McDiarmid, Glengoulandie, Aberfeldy; Peter Robertson, Achilty, Dingwall.

FAT STOCK (CATTLE AND SHEEP).—George Cudckshank, Comisty, Huntly; John Farquharson, 4 Bridge Street, Aberdeen; R. H. Harris, Earnhill, Forres.

HORSES FOR AGRICULTURAL PURPOSES.—James Calder, Colgrain, Cardross; John Dove, East-field, Greenlaw, Dunse; Robert Wilson, Durn, Perth.

HUNTERS, ROADSTERS, PONIES, AND EXTRA HORSES.—R. O. Farquharson of Haughton, Alford; Andrew Gillon of Wallhouse, Bathgate.

CHEVIOT.—William Henderson, Fowberry Mains, Belford; William Hunter, Craighead, Abington; George McCall, Burtance, Lockerbie.

BLACKFACED.—Charles Howatson of Dornel, Mauchline; Duncan McDiarmid, Glengoulandie, Aberfeldy; Peter Robertson, Achilty, Dingwall.

BORDER LEICESTER, LEICESTER, AND LONGWOOLLED.—William Ford, Hardengreen, Dalkeith; Adam Smith, Stevenson Mains, Haddington; George Torrance, Sisterpath, Dunse.

SOUTHDOWN AND SHROPSHIRE.—Thomas Harris, Stoneylane, Bromsgrove; James Skirving, Luffness Mains, Drem.

SWINE.—Peter Eden, Crosslane, Salford; Patrick Small Keir of Kindrogan, Pitlochry.

POULTRY.—James Mollison, Dochgarroch Lodge, Inverness; Thomas Raines, Bridgehaugh, Stirling.

IMPLEMENTS.—*Society's Inspecting Committee*—James W. Hunter of Thurston, Chairman of the Society's Machinery Committee; David Stevenson, C.E., Edinburgh, Consulting Engineer to the Society; James D. Park, Edinburgh, Practical Engineer to the Society; Robert Hutchison of Carlowrie, Kirkliston; P. B. Swinton, Holyn Bank, Gifford; Hugh Morton, Engineer, Leith. *Local Committee*—Alex. Auld, Newton, Rothmaise, Insch, Aberdeen; Alex. Innes of Raemoir, Banchory; Alex. Morrison Gordon of Newton, Insch, Aberdeen; James Reith, South Auchincloch, Skene, Aberdeen; Robert Salmond, Nether Balfour, Durris; William Smith, West Drums, Brechin; George Wilken, Waterside of Forbes, Alford.

LIST OF ATTENDING MEMBERS.

SHORTHORN.—Robert Copland, Mill of Ardlethen, Ellon; Charles Lyall, Old Montrose, Montrose, POLLED ANGUS OR ABERDEEN.—Colonel Ramsay of Bara, Straloch, Aberdeen; James Cocbrane, Little Haddo, Newburgh, Aberdeen.

GALLOWAY.—Alexander Forbes Irvine of Drum, Aberdeen; Alex. F. Leslie, Corskellie, Huntly.

AYRESHIRE.—Colonel Innes of Learney, Torphins; William Walker, Ardhuncart, Mossat.

HIGHLAND.—Robert Grant of Druminnor, Rhynie; Ranald MacDonald, Cluny Castle, Aberdeen.

FAT STOCK (CATTLE AND SHEEP).—Sir George Macpherson Grant of Ballindalloch, Bart.; James Lumsden, Braço, Keith.

HORSES FOR AGRICULTURAL PURPOSES.—Colonel Ferguson of Pitfour, Mintlaw; William A. Mitchell, Auchnagathle, Keig.

HUNTERS, ROADSTERS, PONIES, AND EXTRA HORSES.—Provost Wood, Banff; Henry D. Adamson, Balquhain, Alford.

CHEVIOT.—Henry Gordon of Manar, Inverurie; Silvester Campbell, Kinellar, Blackburn; Aberdeen.

BLACKFACED.—Robert Grant of Druminnor, Rhynie; Ranald MacDonald, Cluny Castle, Aberdeen.

BORDER LEICESTER, LEICESTER, AND LONGWOOLLED.—James T. Oswald of Dunnikier, Kirkcaldy; Adam Singer, Rothmaise, Insch, Aberdeen.

SOUTHDOWN AND SHROPSHIRE.—William McCombie of Easter Skene, Skene, Aberdeen; John Davidson, North Leys, Banchory.

SWINE.—W. E. Nicol of Ballogie, Banchory; William Alexander, Bent of Haulkerton, Laurencekirk.

POULTRY.—Hercules Scott of Brotherton, Bervie; Alex. Cowie, Crombly Bank, Ellon.

IV.—DISTRICT COMPETITIONS.

CATTLE.

NAME OF DIST.	PREMIUM AWARDED TO	FOR	AMOUNT.
<i>County of Stirling</i>	Alex. Buchanan, Whitehouse	Shorthorn Bull, Class I, †L2 & Med. Sil. Med. L.2	10 6*
	A. & J. Christie, Bankhead	do. do.	1 10 0*
	J. T. S. Paterson, Plean	do. do.	0 10 0*
	Hugh Thomson, Blackgrange	do. Class II, †L.1 10s. & Med. Sil. Med.	2 0 6*
	Robert Drysdale, Old Mills	do. do.	1 0 0*
	Archd. Bulloch, Milliken	Ayrshire Heifer L3 & Med. Sil. Med.	3 10 6
	Duncan Keir, Bucklyvie	do.	2 0 0
	William Weir, Inches	do.	1 0 0
Carry forward,			L14 1 6

* Half Premiums awarded, the number of Lots being under four.

† Aged Bulls.

‡ Two-year-old Bulls.

NAME OF DIST.	PREMIUM AWARDED TO	FOR	AMOUNT.	
			Brought forward,	L.14 1 6
<i>Lorn and Nether Lorn</i>	I. & J. Macfarlan, Barnacarry	Highland Bull .	Silver Medal	0 16 0
	Archd. M'Lachlan Camuslaich	do. Class I. L.4 & Med. Sil. Med.		4 10 6
	N. M. M'Donald of Dunach	do. do.		3 0 0
	J. M'Kechnie, jun., Maolachy	do. do.		1 0 0
	K. M. M'Lellan, Melfort	do. Class II. L.3 & Med. Sil. Med.		3 10 6
	Allan Hall, Degnish	do. do.		2 0 0
	Donald M'Callum Baligown	do. do.		1 0 0
	N. M. M'Donald of Dunach	Highland Heifer L.3 & Med. Sil. Med.		3 10 6
	N. M. M'Donald of Dunach Dun. M'Callum, Glenamackrie	do. do.		2 0 0 1 0 0
<i>Argyll</i>	James M'Kechnie, Kirkton	Highland Bull, Class I. L.4 & Med. Sil. Med.		4 10 6
	A. Stevenson, Auchanellan	do. do.		3 0 0
	Peter Sinclair, Upper Largie	do. do.		1 0 0
	Peter Sinclair, Upper Largie	Highland Bull, Class II. L.3 & Med. Sil. Med.		3 10 6
	Peter Sinclair, Upper Largie	do. do.		2 0 0
	Alex. M'Donald, Nether Largie	do. do.		1 0 0
	Alex. M'Donald, Nether Largie	Highland Heifer L.3 & Med. Sil. Med.		3 10 6
	Alex. M'Donald, Nether Largie	do.		2 0 0
	Alex. M'Donald, Nether Largie	do.		1 0 0
<i>Upper Strathearn</i>	J. Drummond, of Blackruthven	Shorthorn Bull	Silver Medal	0 16 0
	John Dickson, Cambushinnie	do. Class I. L.2 & Med. Sil. Med.		2 10 3*
	Wm. Lauder, Locherlour	do. do.		1 10 0*
	Robert Young, Ballyclone	do. Class II. L.3 & Med. Sil. Med.		3 10 6
	John Hart, Kirkland	do. do.		2 0 0
	John Allan, Crieffvechter	do. do.		1 0 0
	Wm. Lauder, Locherlour	Ayrshire Heifer L.3 & Med. Sil. Med.		3 10 6
	Donald M'Laren, Ardveich	do.		2 0 0
	Thos. Crawford, Drummawhance	do.		1 0 0
<i>County of Elgin</i>	G. W. Leslie, Aldronghty	Shorthorn Bull, Class I. Med. Sil. Med.		0 10 6
	James Bruce, Burnside	do. Class II. Med. Sil. Med.		0 10 6
	James Lawrence, Forres Mills	Shorthorn Heifer Med. Sil. Med.		0 10 6
<i>County of Renfrew</i>	Sir M. R. Shaw Stewart, Bart.	Ayrshire Bull	Silver Medal	0 16 0
	Robert Gillespie, Boyleston	do. Class I. Med. Sil. Med.		0 10 6
	Sir M. R. Shaw Stewart, Bart.	do. Class II. Med. Sil. Med.		0 10 6
	Mrs Douglas, Green	Ayrshire Heifer Med. Sil. Med.		0 10 6
<i>East Kiltbride</i>	T. Ballantine, Netherton	Ayrshire Bull	Silver Medal	0 16 0
	R. Gillespie, Boyleston	do. Class I. Med. Sil. Med.		0 10 6
	Robert Wilson, Forehouse	do. Class II. Med. Sil. Med.		0 10 6
	Mrs Douglas, Green	Ayrshire Heifer Med. Sil. Med.		0 10 6
<i>United Banffshire</i>	Andrew Longmore, Rettie	Shorthorn Bull	Silver Medal	0 16 0
	James Murray, Faichfolds	do. Class I. Med. Sil. Med.		0 10 6
	Duncan, Murray & Rust, Banff	do. Class II. Med. Sil. Med.		0 10 6
	John Hannay, Gavenwood	Polled Heifer Med. Sil. Med.		0 10 6
<i>Strathbogie</i>	James Merson, Craigvillie	Shorthorn Bull, Class I. Med. Sil. Med.		0 10 6
	James Bruce, Burnside	do. Class II. Med. Sil. Med.		0 10 6
	James Bruce, Burnside	Shorthorn Heifer Med. Sil. Med.		0 10 6

HORSES FOR AGRICULTURAL PURPOSES.

<i>Easter Ross</i>	George Wilson, Whiteside	Stallion	25 0 0
<i>Dist. of R. Northern Society</i>	George Duncan, Port Elphinstone	Stallion	25 0 0
<i>Dalbeattie</i>	Hugh Andrew, Allans	Stallion	25 0 0

Carry forward, L.161 3 6

* Half Premiums awarded, the number of Lots being under four.

NAME OF DIST.	PREMIUM AWARDED	FOR	Brought forward,	AMOUNT.
<i>Rhins Dist. of Wgshire</i>	John Thomson, Blaiket	Stallion	25 0 0	L.161 3 6
<i>A'ermuchty</i>	David Riddell, Kilbowie	Stallion	25 0 0	
<i>East of Fife</i>	John Galloway, Lochton	Stallion	25 0 0	
<i>Selkirk and Galashiels</i>	James Lawrie, Mitchelston	Brood Mare	L.4 & Med. Sil. Med.	4 10 6
	Andrew T. Elliot, Newhall	do.		3 0 0
	Andrew T. Elliot, Newhall	do.		1 0 0
<i>Caithness</i>	Wm. Purves, Barrack Mains	Brood Mare	L.4 & Med. Sil. Med.	4 10 6
	Jas. Henderson, of Billster	do.		3 0 0
	William Mackay, Quoys of Reiss	do.		1 0 0
<i>West. Dist. of Fife</i>	Charles Hardie, Primrose	Brood Mare	L.4 & Med. Sil. Med.	4 10 6
	Thos. Crawford, Pitbauchlie	do.		3 0 0
	Robert Crawford, Balbougie	do.		1 0 0
<i>Strathendric</i>	Alexander Galbraith, Croy Cunningham	Brood Mare	L.4 & Med. Sil. Med.	4 10 6
	Archd. Muirhead, Drumquhassle	do.		3 0 0
	Peter Crawford, Drumgoyack	do.		1 0 0
<i>County of Inverness</i>	James Mackessack, Earnside	Two-year old Filly	L.3 & Med. Sil. Medal	3 10 6
	Robt. Mather, Druid Temple	do.		2 0 0
	Alex. Shaw, Mains of Leys	do.		1 0 0
	John Hendrie, Castle Heather	One-year old Filly	L.2 & Med. Sil. Medal	2 10 6
	Charles Mackessack, Culblair	do.		1 0 0
	Robt. Anderson of Lochdlu	do.		0 10 0
<i>Island of Skye</i>	John MacLeod, Monkstadt	Two-year old Colt	L.1,10s. & Med. Sil. Med.	2 0 6*
	John MacLeod, Monkstadt	do.		1 0 0*
<i>Black Isle</i>	W. G. C. Asher, Belmaduthy	One-year old Colt	L.2 & Med. Sil. Medal	2 10 6
	Colin Munro, Weston	do.		1 0 0
	Jonathan Middleton, Davidston	do.		0 10 0
	R. Trotter, Garguston	Two-year old Filly	L.3 & Med. Sil. Medal	3 10 6
	D. Cameron, Rhives	do.		2 0 0
	A. Jack, Bog of Achterflow	do.		1 0 0
	R. Trotter, Garguston	One-year old Filly	L.1 & Med. Sil. Medal	1 10 6*
	J. Middleton, Davidston	do.		0 10 0*
	R. Trotter, Garguston	do.		0 5 0*
<i>County of Kinross</i>	William Tod, Gospetry	Two-year old Filly	L.3 & Med. Sil. Medal	3 10 6
	Robert Arnot, Hatchbank	do.		2 0 0
	Robert Barclay, Craigend	do.		1 0 0
	James Walls, Lochran	One-year old Filly	L.2 & Med. Sil. Medal	2 10 6
	Robt. Arnot, Hatchbank	do.		1 0 0
	And. Greig of Holeton	do.		0 10 0

SHEEP.

<i>West Lothian and Eastern District of Stirlingshire</i>	John M'Kinlay, Hardhill	Leicester Tup	L.3 & Med. Sil. Med.	3 10 6
	James Fleming, Carmuir	do.		1 0 0
	John Morrison, West Dalmeny	do.		0 10 0
	John Hill, East Carlowrie	Leicester Shear. Tup	L.3 & Med. Sil. Med.	3 10 6
	John Morrison, West Dalmeny	do.		1 0 0
	John Hill, East Carlowrie	do.		0 10 0
	John M'Kinlay, Hardhill	Leicester Ewes	L.3 & Med. Silver Medal	3 10 6
	James Fleming, Carmuir	do.		1 0 0
	John Morrison, West Dalmeny	do.		0 10 0
	John Hill, East Carlowrie	Leicester Gimmers	L.3 & Med. Sil. Medal	3 10 6
	John Morrison, West Dalmeny	do.		1 0 0
	John Hill, East Carlowrie	do.		0 10 0

Carry forward, L.327 6 6

* Half Premiums awarded, the number of Lots being under four.

NAME OF DIST.	PREMIUM AWARDED	FOR	AMOUNT.
		Brought forward,	L.927 6 6
<i>Coval</i>	James Duncan of Benmore	Blackfaced Tup	Silver Medal 0 16 0
	Robert Scott, Craignafeach	do.	L.3 & Med. Sil. Med. 3 10 6
	Robert Scott, Craignafeach	do.	1 0 0
	Duncan C. Whyte, Ballimore	do.	0 10 0
	Robert Scott, Craignafeach	Blackfaced Shr.Tup	L.1,10s. & Med.Sil.Med 2 0 6*
	Robert Scott, Craignafeach	do.	0 10 0 ^c
	Archd. Clark, Inverchapple	do.	0 5 0 ^c
	Duncan C. Whyte, Ballimore	Blackfaced Ewes	L.3 & Med. Sil. Med. 3 10 6
	Robert Scott, Craignafeach	do.	1 0 0
	Robert Scott, Craignafeach	do.	0 10 0
	Robert Scott, Craignafeach	Blackfaced Gims	L.1, 19s. & Med. Sil. Med. 2 0 6 ⁺
Archd. Clark, Inverchapple	do.	0 10 0*	
<i>County of Forfar</i>	Earl of Dalhousie	Leicester Tup	Silver Medal 0 16 0
	Charles Mitchell, Kintrockat	do.	L.3 & Med. Sil. Med. 3 10 6
	John Taylor Redcastle	Leicester Shear.Tup	L.1,10s.& Med.Sil.Med. 2 0 6*
	John Taylor, Redcastle	do.	0 10 0 ^c
	Charles Lyall, Old Montrose	Leicester Ewes	L.3 & Med. Sil. Med. 3 10 6
	James Swan, Inverpeffer	do.	1 0 0
<i>West Terviot-dale</i>	William M. Oliver, Howpasley	Cheviot Tup	L.3 & Med. Silver Medal 3 10 6
	John Scott, Deloraine	do.	1 0 0
	William Grieve, Skelfhill	do.	0 10 0
	John Scott, Deloraine	Cheviot Shear. Tup	L.3. & Med. Sil. Med 3 10 6
	John Scott, Deloraine	do.	1 0 0
	John Mitchell, Singlee	do.	0 10 0
	James Brydon, Satchells	Cheviot Gims	L.1,19s. & Med. Sil. Med. 2 0 6*
	John Scott, Deloraine	do.	0 10 0*
	James Grieve, Branxholm Braes	do.	0 5 0*
<i>Breadalbane</i>	W. G. Steuart Menzies of Culdares	Blackfaced Tup	Silver Medal 0 16 0
	A. & J. McNaughton, Kerrumore	do.	L.3 & Med. Sil. Med. 3 10 6
	John Hamilton, Conenish	do.	1 0 0
	John Hamilton, Conenish	do.	0 10 0
	John Hamilton, Conenish	Blackfaced Shear. Tup	L.3 & Med. Sil. Med. 3 10 6
	John Hamilton, Conenish	do.	1 0 0
	Alex. McNaughton, Remony	do.	0 10 0
	John Willison, Glenlochay	Blackfaced Ewes	L.3 & Med. Sil. Med. 3 10 6
	Alex. McNaughton, Remony	do.	1 0 0
	Trustees of the late A. McLean, Borlick	do.	0 10 0
	John Willison, Glenlochay	Blackfaced Gims	L.3 & Med. Sil. Med. 3 10 6
	Alex. McNaughton, Remony	do.	1 0 0
	Alex. McNaughton, Remony	do.	0 10 0
<i>Island of Arran</i>	James Allan, jun., Balnaoole	Blackfaced Tup	L.3 & Med. Sil. Med. 3 10 6
	James Allan, jun., Balnaoole	do.	1 0 0
	Robt. Crawford, Glenscorrodale	do.	0 10 0
	William Tod, Glenree	Blackfaced Shear. Tup	L.3 & Med. Sil. Med. 3 10 6
	Donald McAlister, Sannox	do.	1 0 0
	Jas. Allan, sen., Clauhlands	do.	0 10 0
	Jas. Allan, jun., Balnaoole	Blackfaced Ewes	L.3 & Med. Sil. Med. 3 10 6
	Jas. Allan, jun., Balnaoole	do.	1 0 0
	Robt. Crawford, Glenscorrodale	do.	0 10 0
	Jas. Allan, jun., Balnaoole	Blackfaced Gimmers	L.3 & Med. Sil. Med. 3 10 6
	Jas. Allan, sen., Clauhlands	do.	1 0 0
Jas. Allan, jun., Balnaoole	do.	0 10 0	
<i>Edenoch and Rothemurchus</i>	C. F. Gwyer, Binlild	Blackfaced Tup	Silver Medal 0 16 0
	Donald Stewart, Chapelpark	do.	Medium Silver Medal 0 10 6
	Donald Stewart, Chapelpark	Blackfaced Shear. Tup	Med. Silver Medal 0 10 6
	R. Macgregor, Kincraig	Blackfaced Ewes	Med. Silver Medal 0 10 6
	Donald Stewart, Chapelpark	Blackfaced Gimmers	Med. Silver Medal 0 10 6

Carry forward, L.411 11 6

* Half Premiums awarded, the number of Lots being under four.

NAME OF DIST.	PREMIUM AWARDED	FOR	AMOUNT.	
			Brought forward,	L.411 11 6
<i>County of Sutherland</i>	M. Gunn, Culgower	Cheviot Tup	Silver Medal	0 16 0
	J. B. Dudgeon, Crakaig	do.	Medium Silver Medal	0 10 6
	J. B. Dudgeon, Crakaig	Cheviot Shearling Tup	Med. Sil. Med.	0 10 6
	J. B. Dudgeon, Crakaig	Cheviot Ewes	Med. Silver Medal	0 10 6
	J. B. Dudgeon, Crakaig	Cheviot Gimmers	Med. Silver Medal	0 10 6
<i>West Linton</i>	Wm. A. Woddrop, Garvald	Blackfaced Tup	Silver Medal	0 16 0
	Patrick Melrose, West Loch	do.	Medium Silver Medal	0 10 6
	Jas. J. Currie, Yorkston	Blackfaced Shear. Tup	Med. Silver Medal	0 10 6
	Jas. J. Currie, Yorkston	Blackfaced Ewes	Med. Silver Medal	0 10 6
	Jas. J. Currie, Yorkston	Blackfaced Gimmers	Med. Silver Medal	0 10 6
<i>Upper Ward of Lanarkshire</i>	James Paterson, Carnacoup	Cheviot Tup	Silver Medal	0 16 0
	Alex. Denholm, Bailtaws	do.	Med. Silver Medal	0 10 6
	Wm. Hunter, Craighead	Cheviot Shearling Tup	Med. Silver Medal	0 10 6
	Wm. Hunter, Craighead	Cheviot Ewes	Med. Silver Medal	0 10 6
	Wm. Hunter, Craighead	Cheviot Gimmers	Med. Silver Medal	0 10 6
<i>Mull, Coll, and Tyree</i>	Duncan Fletcher of Glenaros	Blackfaced Tup	Med. Silver Medal	0 10 6
	Donald M'Pherson, Lettermore	Blackfaced Shear. Tup	Med. Silver Medal	0 10 6
	John Thomson, Aros Mains	Blackfaced Ewes	Med. Silver Medal	0 10 6
	William Lang of Glengorm	Blackfaced Gimmers	Med. Silver Medal	0 10 6
			<u>L.422</u>	<u>7 6</u>

SPECIAL GRANTS.

<i>Edinburgh Christmas Club</i>	Vote in aid of Premiums,	L.50 0 0
<i>Glasgow Agricultural Society</i>	Vote in aid of Premium for Thoroughbred Stallion,	50 0 0
<i>Ayrshire</i>	Vote to Dairy Produce Show at Kilmarnock,	20 0 0
<i>Unst Society</i>	Vote in aid of Premiums,	10 0 0
<i>Westray Society</i>	Vote in aid of Premiums	3 0 0
		<u>L.133 0 0</u>

MEDALS IN AID OF PREMIUMS GIVEN BY LOCAL SOCIETIES.

ABERDEENSHIRE.		
NAME OF DISTRICT.	MEDAL AWARDED TO	FOR
<i>Auchindoir, Kildrummie, and Towie</i>	Peter Cran, Old Morlich	Polled Bull
	James Walker, Westside of Brux	Polled Cow
	John Wattie, Milton	Shorthorn Bull
	David Baillie, Mains of Rhynie	Shorthorn Cow
<i>Cromar, Upper Dee and Ponside</i>	Duncan Reid, Smiddyhill	Polled Bull
	Marquis of Huntly	Polled Cow
	James M'Combie, Daugh	Shorthorn Bull
	John Begg, Lochnagar Distillery	Shorthorn Heifer
<i>Ebriesside</i>	John S. Yull, Little Ardo	Draught Mare
	Alex. Marshall, Overton	Shorthorn Bull
<i>Fyvie</i>	William Mackie, Petty	Shorthorn Bull
	Theodore Henderson, Cammaloun	Draught Mare
<i>Insch</i>	Mrs Moir, Mains of Wardhouse	Cured Butter
	Mrs Scott, Wrangham	Poultry
<i>Keig</i>	Rev. G. Wilson, Fetternear	Brahmapootra Cock
	Mrs Paterson, Newtown	Fresh Butter

NAME OF DISTRICT.	MEDAL AWARDED TO	FOR
<i>Kincardine-O'Neil and Upper Deeside</i>	Mrs Ross, Milltown	Sweet Milk Cheese
	Mrs Davie, Waukmill	Cured Butter
<i>Kinnethmont</i>	Miss Anne Petrie, Craigmyle	Oatmeal Cakes
	William Stewart, Auchindellan	Shorthorn Bull
	William A. Mitchell, Auchnagathle	Shorthorn Heifer
<i>Mar</i>	James Moir, Mains of Wardhouse	Polled Heifer
	David Burness, Boghead	Shorthorn Bull
	Silvester Campbell, Kinellar	Shorthorn Heifer
	William M'Combie of Easter Skene	Polled Heifer
<i>North-East Aberdeenshire</i>	Thomas Innes, Wogle	Dranght Filly
	Samuel Stewart, Sandhole	Shorthorn Bull
	James Beedie, Ardlaw Mains	Polled Heifer
	John Fowle, Mains of Forrntt	Brood Mare
	James Cruickshank, Ladysford	Dairy Produce
<i>North of Scotland Root, Vegetable, and Fruit Asso- ciation</i>	Robert Chapman, Powkburn	Collection of Seeds
	Robert Chapman, Powkburn	Collection of Roots
	Wm. Yool, Glenloggie	Collection of Turnips
	David Littlejohn, Shiels	Collection of Potatoes
<i>Vale of Aford</i>	John King, Blackslack	Polled Bull
	George Wilken, Waterside of Forbes	Swedish Turnips
<i>Warthill</i>	James Strachan, Wester Fowlis	Yellow Turnips
	William Leslie of Warthill	Swedish & Yellow Turnips
	Adam Johnston, Baldyquash	Yellow Turnips
	ARGYLLSHIRE.	
<i>Kintyre</i>	William Mitchell, Tirfergus	Ayrshire Bull
	Robert Clark, Skeroblin	Brood Mare
	William Maxwell, Barasko Mill	Blackfaced Tup
<i>Lochbuy</i>	Robert Dickie, Killeonan	Sweet Milk Cheese
	Donald M'Phail, Laggan	Highland Cow
	Dugald M'Phail, Barachendrumen	Blackfaced Tup
	AYRSHIRE.	
<i>Carrick</i>	James Nicol Fleming of Knockdon	Ayrshire Cow
	Robert Paton, Trees	Ayrshire Bull
	James Nicol Fleming of Knockdon	Dranght Mare
	Thomas Crawford, Drumbeg	Dranght Gelding
<i>Coylton and Stair</i>	John Sloan, Barnhill	Blackfaced Tup
	John Ritchie, Broadwood	Ayrshire Cow
<i>Craigie</i>	John Thom, Boymanston	Dranght Mare
	William Allan, Hill of Barnweill	Ayrshire Bull
	William Allan, Hill of Barnweill	Ayrshire Cow
<i>Dalry</i>	James Picken, Laigh Langside	Dranght Mare
	James Craig, Holmas	Ayrshire Bull
<i>Dalrymple</i>	John Brown, Lissens Moss	Ayrshire Cow
	John Dick, Doonholm	Ayrshire Cow
<i>Darvel</i>	Bryce Martin, Knockshinnoch	Dranght Mare
	Matthew Miller, Bowhill	Cheese
<i>Givran</i>	Wm. Noble, Ladeside	Roots
	John Campbell, Knockbeen	Ayrshire Cow
<i>Irvine</i>	W. & J. Bone, Shallochpark	Bood Mare
	William Brown, Cartleburn	Ayrshire Cow
<i>Kilmarnock</i>	Robert Hutchison, Craigslaid	Dranght Mare
	William Smith, Chanlockfoot	Ayrshire Bull
	James Howie, Burnhouses	Ayrshire Cow
<i>Kirkmichael</i>	James Picken, Laigh Langside	Dranght Mare
	William Anderson, Barniel	Ayrshire Bull
	William Anderson, Barniel	Ayrshire Cow
	Andrew Gerrand, Burnbank	Ayrshire Heifer
<i>Loudoun & Lanfine</i>	David Hunter, Gultreehill	Dranght Filly
	John Howat, Burnhead	Ayrshire Bull
<i>Muirkirk</i>	Captain Alex. Steel, Burnhead	Ayrshire Cow
	John Howat, Burnhead	Ayrshire Bull
	William Guthrie, Cunnock	Ayrshire Cow
	John Morton, Dykenenk	Dranght Gelding
	James Craig, Polquhneys	Blackfaced Tup
	Gavin Moffat, Burnfoot	Collection of Roots
	Alex. Clark, Bankend	Sweet Milk Cheese

NAME OF DISTRICT.	MEDAL AWARDED TO	FOR
<i>New Cumnock</i>	Ivie Campbell, Craigmair	Ayrshire Bull
	And. McCartney, Gatehead	Ayrshire Cow
	James Picken, Laigh Langside	Draught Mare
	John Mitchell, Lochingerloch	Blackfaced Tup
<i>Sorn</i>	James Baird, Blindburn	Ayrshire Bull
	W. & J. Weir, Westtown	Ayrshire Cow
	John Watson, Daldorch	Brood Mare
<i>Symington</i>	Thos. Aitken, Laigh Burn O'Need	Scotch Grey Poultry
	Alex. Paton, Stonecalsey	Ayrshire Bull
	Alex. Paton, Stonecalsey	Ayrshire Cow
BANFFSHIRE.		
<i>Central Banffshire</i>	William Cantlie, Keithmore	Shorthorn Bull
	Sir Geo. Macpherson Grant of Ballindalloch, Bt.	Polled Cow
	William Longmore, Keith	Draught Mare
	James McWilliam, Stoneytown	Oats
	Robert Turner, Brankanentham	Barley
	Mrs Keir, Drum	Cured Butter
BERWICKSHIRE.		
<i>Lammermoor</i>	James Harper, Snawdon	Cheviot Ewe Lambs
	James Harper, Snawdon	Cheviot Gimmers
DUMBARTONSHIRE.		
<i>Cumbernauld</i>	William Scott, Condorrat	Ayrshire Cow
	John Anderson, Smithstown	Ayrshire Bull
	Mathew Dunlop, Waterhead	Brood Mare
<i>Dumbartonshire</i>	David Biddell, Kilbowie	Ayrshire Bull
	J. M. Martin, yr. of Auchendennan	Ayrshire Heifer
	James Calder, Colgrain	Leicester Tup
	Peter Lennox, Kirkton	Leicester Ewe
DUMFRIESSHIRE.		
<i>Annandale</i>	John Johnstone of Halleaths	Shorthorn Bull
	James Cunningham, Tarbreoch	Galloway Cow
	Robert Drummond, Millbank	Ayrshire Cow
	Thos. N. Grierson, Woodside Mills	Half-bred Hogs
EDINBURGHSHIRE.		
<i>Dalkeith</i>	Duke of Buccleuch	Shorthorn Cow
	Andrew Pate, Middleton	Ayrshire Cow
	Andrew Pate, Middleton	Brood Mare
	Thomas Stevenson, Mount Lothian	Draught Filly
	Duke of Buccleuch	Leicester Tup
	Duke of Buccleuch	Boar
FIFESHIRE.		
<i>Dunnikier</i>	David Stark, Wester Bogie	Shorthorn Bull
	Robert Birrell, Overtown	Cross Cow
	Robert Balfour, Muttonhall	Brood Mare
INVERNESS-SHIRE.		
<i>Strathglass</i> <i>Strathspey</i>	George McKenzie, Balmore	Sandy Oats
	Earl of Seafield	Highland Bull
	Charles Grant, Mains of Advie	Polled Heifer
	John Smith, Inverallan	Collection of Roots
	Wm. Cruickshank, Glenbeg	Farm Management
	Charles Grant, Mains of Advie	Green Crop
KINCARDINESHIRE.		
<i>Strachan</i>	James Rust, Bowbutts	Collection of Roots
	Mrs Alex. Laing, Bowbutts	Poultry
LANARKSHIRE.		
<i>Biggar</i>	Alex. Monfries, Skirling	Ayrshire Cow
	Robert G. Murray, Spittal	Brood Mare
	A. P. Hope, yr. of Bordlands	Leicester Tup.

NAME OF DISTRICT.	MEDAL AWARDED TO	FOR
<i>Calder Waterhead</i>	Robert Brownlie, Carluke Alex. Brackenridge, V.S., Stevenston Mains	Ayrshire Bull Entire Colt
<i>Upper Ward of Lanarkshire</i>	Charles E. Cranstoun of Corehouse John Hamilton, North Cumberhead	Ayrshire Bull Blackfaced Tup
LINLITHGOWSHIRE.		
<i>Eathgate</i>	T. L. Learmonth of Parkhall James Williamson, Greenhead John Waddell of Inch T. L. Learmonth of Parkhall	Shorthorn Bull Ayrshire Cow Draught Gelding Leicester Tup
PERTSHIRE.		
<i>Dunning</i>	Miss Jane Whyte, Baadhead	Cured Butter
<i>Moulin</i>	H. B. Stewart of Balnakeilly	Turnips
<i>Strathearn (Central)</i>	Robert Gardiner, Chapelbank John Whyte, Muirhead Robert Gardiner, Chapelbank	Clydesdale Mare Leicester Shearling Tup Common Barley
RENFREWSHIRE.		
<i>Lower Ward of Renfrewshire</i>	William Howie, Finnockbog Sir M. R. Shaw Stewart, of Blackhall, Bart. John Scott, Hillside John Laird, Faulds	Ayrshire Bull Ayrshire Cows Blackfaced Tup Blackfaced Ewes
<i>Mearns</i>	James Mitchell, Blackhouse John Carslaw, Humble	Ayrshire Cow Draught Gelding
<i>Neilston</i>	Robert Gillespie, Boyleston John Holm, Japston	Ayrshire Bull Ayrshire Cow
STIRLINGSHIRE.		
<i>Bucklyvie and Gartmore</i>	John More, Fordhead Robert McArthur, Borland	Ayrshire Cow Draught Mare
WIGTOWNSHIRE.		
<i>Kirkmavlen</i>	Samuel McCulloch, Balgown 153 Medium Silver Medals, L.80, 6s. 6d.	Turnips

PLOUGHING COMPETITIONS.

In 1875-76 the Society's Minor Silver Medal was awarded at 188 Ploughing Competitions as follows:—

NO.	NAME OF SOCIETY.	PLACE OF COMPETITION.	SILVER MEDAL AWARDED TO
1.	Aboyne.	Mains of Aboyne.	James Reid, Bridgend.
2.	Bellhelvie.	Middle Ardo.	Robert Burnett, Damhead.
3.	Buchan.	Netherton.	Alex. Fraser, Dens.
4.	Coldstone and Migvie.	Cairnmore.	Wm. M'Combie, Daugh.
5.	Corgarff.	Cockbridge.	William Philip, Garchory.
6.	Countesswells.	South Lasts.	James Dumbar, Colthill.
7.	Crathie.	Abergeldie.	Wm. Couits, Lochnagar.
8.	Drumblade.	Dukewell.	James Simpson, Slich.
9.	Ebleside.	Skilmattilly.	William Smith, Lintriggs.
10.	Leht, Skene, &c.	Garrack.	Arthur Forbes, Nether Mains.
11.	Glenmuick.	Crofts of Glenmuick.	Robert Ferres, Eastfield.
12.	Kinnethmont, &c.	Morston.	Alex. Thomson, Sunnyside.
13.	Lochel Cushine.	Wester Fowlis.	Wm. Emslie, Mountseat.
14.	Lamphanan.	Kineraigie.	Alex. Gilbert, Bogloch.
15.	Mar.	Glasgoforest.	David Donald, Greenburn.
16.	North-East Aberdeenshire.	New Seat.	William Michie, Ardlaw.
17.	Strathbogie.	Westerton.	Ian Morrison, Auchaber.
18.	Stichen.	Middlethrid.	And. Quirie, Auchtygills.
19.	Vale of Aifort.	Guize, Tough.	Wm. Law, Calfward.
ARGYLLSHIRE.			
20.	Ardnamurchan.	Kilchoan.	James Watt, Achaterny.
21.	Glenorchy.	Ctalg.	T. Carnichael, Maerse, Glenorchy.

NO.	NAME OF SOCIETY	PLACE OF COMPETITION	SILVER MEDAL AWARDED TO
22.	Islay, Jura, and Colonsay,	Islay House Farm.	Hector M'Kelvie, Daill.
23.	Kilfinan.	Kildavaig.	John Duncan, Stealig.
24.	Killean and Kilcalmonell.	Gortinanane.	Chas. Mackinven, Auchinarane.
25.	Kintyre.	Dalrioch.	Thos. Gemmell, Dalrioch.
26.	Lochbuy.	Lochbuy.	Donald MacAlpin, Lochbuy.
27.	Lorn.	Achnaba.	John Brown, Delnacabaig.
28.	Nether Lorn.	Kilbride.	Alex. Jackson, Ardincaple.
29.	Salen.	Killichronan.	Ebenezer Marshall, Ledmore.
AYRSHIRE.			
30.	Ayr and Alloway.	Holmston.	William Murdoch, Corton.
31.	Coylton.	Byres.	Jas. Murdoch, Knocksoul.
32.	Dalry.	Glencart.	Wm. Brown, Lyleston.
33.	Fenwick.	South Craig.	Jas. Stevenson, North Craig.
34.	Galston.	Cowgore.	Jas. Craig, Overland.
35.	Kilmarnock.	South Dean.	Hugh White, Wraes.
36.	Kirkmichael.	Goosehill.	Quintin Young, Barweys.
37.	Kirkoswald.	Glenhead.	Wm. Sloss, Park.
38.	Loudoun and Lanfine.	Newton.	Robt. Fleming, Knevoeklaw
39.	Monkton and Prestwick.	Newlands.	Alex. Wilson, Muirhouse.
40.	New Cumnock.	Rigghead.	John Young, Lowes.
41.	Ochiltree.	Hill.	Quintin Young, Barweys.
42.	Sorn and Dalgain.	Daldoroch.	Chas. Baird, North Blairkip.
43.	Stewarton.	Castleton.	Jas. Kirkland, Law.
44.	Straiton.	Longcroft.	Wm. Scott, Dallowie.
45.	Tarbolton.	Outmainy,	Robert Neill, West Doura.
BANFFSHIRE.			
46.	Aberlour.	Kinermomy.	Alex. M'Kerron, Lyntian.
47.	Keith.	Keith.	W. Sandieson, Mains of Auchynianie.
48.	Marnoch.	Quarryhill.	Wm. Simpson, Mains of Ardmearie.
BERWICKSHIRE.			
49.	Coldstream.	Lennel Hill.	John Gibb, Milne Graden.
50.	Eccles.	Grizebig.	Thos. Slater, Ecclestofts.
51.	Lammermoor.	Redpath.	Robt. Crow, Abbey St Bathans.
52.	Lauderdale.	Carfrae Mill.	Thos. Simson, Addinstone.
53.	Westruther.	Hindside Hill.	Robt. Hill, Dods.
BUTE AND ARRAN.			
54.	Bute.	Langalehorad,	Jas. M'Alister, Mid Ascog.
55.	Arran.	Shedog.	Daniel M'Donald, Beanan.
CAITHNESS-SHIRE.			
56.	Caithness	Gerston.	John Bain, Coghill.
CLACKMANNANSHIRE.			
57.	Hillfoots.	Woodside.	Alex. Jameson, Meadowhill.
DUMBARTONSHIRE.			
58.	Cumbernauld.	Airdriehead.	John Allan, Westerwood.
59.	Kilmarnock and Bowhill.	Mains.	Walter Bilsland, Mains.
60.	Kirkintilloch.	Dumbreck.	Daniel Donachie, Hayston.
DUMFRIESSHIRE.			
61.	Canonbie.	Archerbeck.	George Bell, Shillingmoss.
62.	Glencairn.	Slatchouse.	William Weir, Gordieston.
63.	Keir.	New Mains.	John Swan, Barrhill.
64.	Kirkconnel.	Drumbuie.	Wm. Gibson, Burnfoot.
65.	Mid-Nithsdale.	Kirkland.	Wm. Campbell, New Cample.
66.	Westerkirk.	Potholm.	Alex. Murray, Bailliehill.
EDINBURGHSHIRE.			
67.	Currie.	Bankhead.	Wm. Finlay, Currievale.
68.	Glencross.	Ravensnuk.	Jas. Hunter, Greenland Mains.
69.	Lasswade.	Mountmarie.	Robt. Trench, Melville Castle.

NO.	NAME OF SOCIETY.	PLACE OF COMPETITION.	SILVER MEDAL AWARDED TO
70.	Mid-Lothian.	Kippielaw.	Alex. Ramsay, Mayfield.
71.	Penicuik.	Lawhead.	Wm. Stewart, Mount Lothian.
72.	Temple.	Yorkston.	Thos. Simpson, Toxside.
73.	West Calder.	Brotherton.	Wm. Dalziel, Muirhousedykes.
ELGINSHIRE.			
74.	Boharm.	Auchroisk.	John Davidson, Soundmuir.
75.	Cromdale.	Dallachapple.	John Grant, Dallachapple.
76.	Edinkillie.	Edinkillie.	John Stronach, Mvashack.
77.	Elgin (Western District).	Manben.	Alex. Edward, Woodside.
78.	Knockando, &c.	Longerook.	James Ross, Mains of Ballintomb.
79.	Morayshire.	Earnhill.	John Edwards, Mosstowie.
80.	Rothies and Speymouth.	Collie.	Geo. Ross, Orbliston.
81.	St Andrews.	Linkwood.	Jas. Laing, Troves.
82.	Spey, Avon, and Fiddochside.	Ballindalloch.	Chas. Kemp, Ballindalloch.
83.	Urquhart.	Upper Meft.	John Watt, Stonewells.
FIFE SHIRE.			
84.	Crossgates.	Keirsbeath.	And. Rutherford, Scotswalls.
85.	Culross.	Carnell.	Geo. Cousin, Saline Shaw.
86.	Dunnikier.	Fosterton.	And. Wright, Dunnikier.
87.	East of Fife.	Anstruther.	Jas. Gray, jun., Comielaw.
88.	Howe of Fife.	Ramornie Mains.	Wm. Todd, Lawfield.
89.	Largo.	Wester Lathallan.	Jas. Adamson, Bankhead.
90.	Leslie.	Balgomery.	David Leighton, Farnlands.
91.	North of Fife.	Wester Kilmany.	Robt. Pearson, Gauldy.
FORFARSHIRE.			
92.	Mains and Strathmartine.	Lilbathen.	Thos. Anderson, Magdalens.
93.	Tannadice and Oathlaw.	East Memus.	David Whytock, Glen Ogil.
INVERNESS-SHIRE.			
94.	Abermethy.	Coulnakyle.	Donald McQueen, Dell.
95.	Badenoch and Rothiemurchus.	Bancher.	John Mollison, Kerrow.
96.	Duthil.	Dalvoul.	A. Cameron, Shillichan.
97.	Glen Urquhart.	Allamore.	Simon Fraser, Drumadrochet.
98.	Inverness.	Beechwood.	Angus Robb, Torrich.
99.	Strathdearn.	Freeburn.	Jas. McGillivray, Invereen.
100.	Stratherrick.	Glenlea.	Jas. McKay, Ledelune.
101.	Strathglass.	Wester Invercannich.	Donald McDonald, Erchless.
102.	Strathspey.	Tallichgorm.	Donald McIntosh, Croftroman.
KINCARDINESHIRE.			
103.	Durris.	Boginreath.	Jas. Campbell, Curraelstone.
104.	Muchalls and Cookney.	Burn Orrachy.	Wm. Milne, Wineford.
100.	Nigg.	Torry.	Lauchlan Kemp, Craig Inches.
106.	Portlethen.	Mains of Portlethen.	Alex. Yule, Mains of Findon.
107.	Rickarton and Urie.	Nether Anquhollie.	Wm. Moir, Blackburn.
108.	Strachan.	Haugh.	Robt. Shepherd, Haugh.
STEWARTY OF KIRKCUDBRIGHT.			
109.	Glenkens.	Viewfield.	Wm. Coltart, New Galloway.
110.	Kirkcudbright.	Culhavan.	Charles Develin, Muncraig.
111.	Kirkpatrick Durham.	Holehouse.	Stewart Nivison, Laidlaugh.
112.	New Abbey.	Maryfield.	David Connol, Maxwellbank.
114.	Penningsham, Minnigaff, &c.	Calgow.	James Diamond, Calgow.
114.	Rerrick.	Netherlaw.	Wm. Brown, Balg.
LANARKSHIRE.			
115.	Cadder.	Barnulloch.	James Cameron, Buchlay.
116.	Calderswaterhead.	Windyedge.	Wm. Aitkenhead, Caith.
117.	Carstairs.	Carstairs.	Daniel Boyle, Muirhead.
118.	Dunsyre.	Easton.	Jas. Rutherford, Grange.
119.	Hamilton.	Crookedstonemuir.	John Ballantyne, Shotlin.
120.	Lanark.	Millmoor.	Thos. Black, Bankhead.
121.	New Monkland.	Ryding Mains.	Wm. Robb, Rocksolloch.

NO.	NAME OF SOCIETY.	PLACE OF COMPETITION.	SILVER MEDAL AWARDED TO
122.	Old Monkland.	Easter House.	Wm. Murray, Viewpark.
123.	Wiston and Robertson.	Wiston Mill.	James Little, Chesterhall.

LINLITHGOWSHIRE.

124.	Blackburn.	Seafield.	Robt. Burton, Pottishaw.
125.	Kinneil.	Woodhead.	Peter Jamieson, Upper Kinneil.

NAIRNSHIRE.

126.	Ardclach.	Keppernock.	James Hendrie, Airdrie.
127.	Nairnshire.	Kinudie.	Alex. Hendry, Springfield.
128.	Strathnairn.	Cantraybruch.	Hugh Miller, Mains of Croy.

ORKNEY.

129.	Burray.	Bue.	William Wylie, Sutherland.
130.	Evie & Rendall.	Gravin.	William Sinclair, Midland.
131.	Rousay.	Banks.	Thomas Gibson, Quoys.
132.	St Andrews.	Barns.	James Beus, Newark.
133.	Shapinsay.	Waltness.	Chas. Anderson, Balfour Mains.
134.	South Ronaldshay.	Card.	Robert Mackenzie, Berriedale.
135.	Unst.	Uyasound.	Fedn. Gifford, Uyasound.
136.	Westray.	Fribo.	Thomas Schollie, Clifton.

PEEBLESHIRE.

137.	Eddlestone.	Shiplaw.	John Fleming, Darnhall.
138.	Newlands.	Noblehouse.	Alex. Pennycook, Hyndford Well.
139.	Peeblesshire (Open).	Hyndford.	Robert Graham, Hyndford.
140.	West Linton and Dalplinton.	Garvaid.	John Keland, Garvaid.

PERTSHIRE.

141.	Ardoch.	Bennie.	Robert Harris, Cromlix.
142.	Arnprior.	Tipperdarroch.	John Kennedy, Littlekerse.
143.	Blair-Drummond, &c.	Dripend.	James Graham, Baad.
144.	Breadalbane.	Duntium.	Wm. Fernie, Portbane.
145.	Bridge of Earn.	Pitkeathley Mains.	Alex. Seaton, Brickhall.
146.	Callander.	Dalvey.	Duncan Ferguson, Mollan.
147.	Drummond Castle.	Findal.	Geo. Nairn, Mains of Drummond.
148.	Faskally.	Faskally.	James Frazer, Drumchory.
149.	Foss and Strathmunnell.	Kynachan.	Duncan Stewart, Tominteanda.
150.	Glenalmond.	Francesfield.	John Anderson, Buchanty.
151.	Glenlyon.	Balnahannait.	John Cameron, jun., Roro More.
152.	Logie and Lecrop.	Greenock.	Jas. Turnbull, Manor Neuck.
153.	Madderty.	Cowden.	Robert, Pullar, Dubheads.
154.	Methven.	Whitebank.	James Douglas, Clathy.
155.	Mid. D. of Athole & Tullymet.	Newton.	Alex. Seaton, Baledmund.
156.	Monzievaird and Strowan.	Lawers.	Wm. McIntyre, Brainercroft.
157.	Moulin.	Pitfourie.	John Forbes, Pittarig.
158.	Port of Monteith.	Boreland.	Alex. Millar, Blairhoyle.
159.	Ranoch.	Drumchastle.	Allan Cameron, Tullocherosk.
160.	St Martins.	Cairnbeddie.	J. Carr, Melginch.
161.	Stormont Union.	Craigend of Clunie.	John Macfarlane, Little Fardie.
162.	Strathbraan.	Deanshaugh.	Alex. Stewart, Ballinlick.
163.	Strathearn (Central).	Hienhill.	David Graham, Clathy Gask.
164.	Strathord.	Colley.	John Malcolm, Speedyhill.
165.	Struan, Glengarry, &c.	Calvine.	Alex. McIntosh, Tomnacuag.
166.	Thornhill.	Mid Frew.	Jas. Paterson, Stock O'Broom.
167.	Weem.	Castie Menzies.	Duncan Robertson, Weem Hotel.

RENFREWSHIRE.

168.	Cathcart and Eastwood.	Drumby.	Robert Watson, Sheep Park.
169.	Erskine.	West Glenshinnoch.	John McNeill, Hairshaw.
170.	Greenock, Gourock, &c.	Trumpethill.	William Wilson, Bankfoot.
171.	Kilbarchan.	Mains of Milliken.	John Morrieson, Forehouse.
172.	Kilmalecoln & Port-Glasgow.	Kilmalecoln.	Thomas Crawford, Greenock.

ROSS-SHIRE.

NO.	NAME OF SOCIETY.	PLACE OF COMPETITION.	SILVER MEDAL AWARDED TO
173.	Black Isle.	Balnakyle.	Alex. Robertson, Quarryfield.
174.	Nigg.	Culnaha.	Wm. M'Kenzie, Aukerville.
175.	Tarbat.	Bindole.	Alex. Bain, Geanies Mains.
176.	Wester Ross.	Tulloch.	Duncan Henderson, Tomich.

ROXBURGHSHIRE.

177.	Lilliesleaf.	Easter Lilliesleaf.	James Hume, Easter Lilliesleaf.
178.	West Teviotdale.	Horsleyhill.	Charles White, Spittal.

STIRLINGSHIRE.

179.	Baldernock.	Blairskaith.	Thos. Stewart, Lavrockhill.
180.	Bannockburn, Pleau, &c.	Milton Mills.	Thos. M'Farlane, Auchenbowie.
181.	Craigforth and Touch.	South Carsebonny.	Wm. Bryson, Shaw of Touch.
182.	Eastern Dist. of Stirlingshire.	Easter Carmuir.	Wm. Robb, Cobblebrae.
183.	Strathendrick.	Laighparks.	Jas. Paul, Croy Cunningham.

SUTHERLANDSHIRE.

184.	Kincardine and Creich.	Creich.	Colin Munro, Ardigay.
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WIGTOWNSHIRE.

185.	Kirkmaiden	Terally.	Thos. M'Colin, Stockmill.
186.	Machars.	Galloway House.	Robert M'Lelland, Kirkland.
187.	Old Luce.	Broompark.	James Agnew, Carscreugh.
188.	Stoneykirk.	Three Mark.	James Robertson, Milmain.

188 Minor Silver Medals, L.56, 8s.

V.—COTTAGES AND GARDENS.

1. BEST KEPT COTTAGES AND GARDENS.

FIFESHIRE.

<i>Newburgh</i>	Robert Blyth	Cottage L.1 and Minor Silver Medal	L.1	6	0	
	William Coventry	do.		0	10	0
	John Young	do.	Minor Silver Medal	0	6	0
	William Mitchell	Garden L.1 and Minor Silver Medal	1	6	0	
	John Young	do.		0	10	0
	Robert Blyth	do.	Minor Silver Medal	0	6	0

KINCARDINESHIRE.

<i>Fettercairn</i>	William Birse	Cottage		1	0	0
	Robert Murray	do.		0	10	0
	James Taylor	Garden L.1 and Minor Silver Medal	1	6	0	
	William Thomson	do.		0	10	0
	Alexander Stott	do.	Minor Silver Medal	0	6	0
	David Carnegie	do.	Minor Silver Medal	0	6	0
	<i>(1st Prize in 1875)</i>					

LINLITHGOWSHIRE.

<i>Dalmeny and Queensferry</i> .	Mrs Proven	Cottage L.1 and Minor Silver Medal	1	6	0	
	Mrs Alex. Lawrie	do.		0	10	0
	Mrs George Baillie	do.	Minor Silver Medal	0	6	0
	Benjamin Miles	Garden L.1 and Minor Silver Medal	1	6	0	
	Henry Reid	do.		0	10	0
	Robert Grant	do.	Minor Silver Medal	0	6	0
<i>Kirkliston</i>	John Weston	Garden L.1 and Minor Silver Medal	1	6	0	
	Peter Douglas	do.		0	10	0
	James T. Johnstone	do.	Minor Silver Medal	0	6	0
	John M'Kenzie	do.	Minor Silver Medal	0	6	0
	<i>(1st Prize in 1875)</i>					

Carry forward L.14 14 0

		Brought forward,	L.14 14 0
PERTHSHIRE.			
<i>Dumbarney</i>	John Campbell	Cottage L.I and Minor Silver Medal	1 6 0
	Lawrence Dewar	do.	0 10 0
	Ebenezer Wallace	do. Minor Silver Medal	0 6 0
	Alexander Rattray	Garden L.I and Minor Silver Medal	1 6 0
	Lawrence Dewar	do.	0 10 0
	John Sime	do. Minor Silver Medal	0 6 0
			<hr/>
			L.18 18 0

2. MEDALS FOR COTTAGES AND GARDENS AND GARDEN PRODUCE.

Medium Silver Medals were awarded to the following:—

ABERDEENSHIRE.			
<i>Keig</i>	William Millar	Cottage	
	Alexander Young	Garden	
DUMBARTONSHIRE.			
<i>Va'e of Leven and Dumbarton</i>	John Stewart	Garden	
	D. M'Callum	Garden	
EDINBURGHSHIRE.			
<i>Roslin</i>	Alexander Grant	Garden	
	Alexander Ketchen	Flower Plot	
FIFESHIRE.			
<i>Auchtermuchty and Stratmiglo</i>	David Galloway	Garden	
	David Galloway	Vegetables	
INVERNESSSHIRE.			
<i>Badenoch and Rothiemurchus</i>	John Macdonald	Cottage	
	John Campbell	Garden	
KINCARDINESHIRE.			
<i>Fordoun, Glenberrie, and Arbathnott</i>	James Robertson, M.D.	Flowers	
	Harry Britton	Vegetables	
LANARKSHIRE.			
<i>Bothwell</i>	Robert Kirk	Cottage	
	George Dickson	Garden	
<i>Hutchesontown</i>	James Leith, jun.	Vegetables	
	Robert Hendry	Garden Plot	
<i>Shettleston</i>	William Livey	Flowers	
	John Stodart	Vegetables	

18 Medium Silver Medals, L.9, 9s.

VI. VETERINARY DEPARTMENT.

ANNUAL EXAMINATION—APRIL 1876.

J. M'Fadyean, Newton-Stewart,	General Examination,	Med. Gold Medal,	L.6 2 0
R. Rain, Castle-Douglas,	Practical Examination,	Med. Gold Medal,	6 2 0

CLASS EXAMINATIONS—APRIL 1876.

EDINBURGH VETERINARY COLLEGE.

G. W. Watson, Orkney,	Veterinary Medicine and Surgery,	Silver Medal,	0 16 0
G. W. Watson, Orkney,	Cattle Pathology,	Silver Medal,	0 16 0
G. W. Watson, Orkney,	Anatomy,	Silver Medal,	0 16 0
J. M'Fadyean, Newton-Stewart,	Physiology,	Silver Medal,	0 16 0
J. M'Fadyean, Newton-Stewart,	Chemistry,	Silver Medal,	0 16 0
J. M'Fadyean, Newton-Stewart,	Materia Medica,	Silver Medal,	0 16 0
J. M'Fadyean, Newton-Stewart,	Botany,	Silver Medal,	0 16 0

Carry forward, L.17 16 0

		Brought forward,	L.17 16 0
NEW VETERINARY COLLEGE, EDINBURGH.			
Daniel Webster, Riccall,	Horse Pathology,	Silver Medal,	0 16 0
G. Watson, Middlesboro',	Cattle Pathology,	Silver Medal,	0 16 0
Henry Snarry, Malton,	Physiology,	Silver Medal,	0 16 0
Henry Snarry, Malton,	Chemistry,	Silver Medal,	0 16 0
Owen Coll, Brucee,	Materia Medica,	Silver Medal,	0 16 0
J. Sandeman, Kirriemuir,	Botany (1875),	Silver Medal,	0 16 0
GLASGOW VETERINARY COLLEGE.			
George Hill, Glasgow,	Horse Pathology,	Silver Medal,	0 16 0
George Hill, Glasgow,	Cattle Pathology,	Silver Medal,	0 16 0
Alex. Chivas, Peterhead,	Physiology,	Silver Medal,	0 16 0
J. C. Atkinson, Manchester,	} Examination of Horses as to	{ Silver Medal,	0 16 0
J. Hadden, Moffat,				} soundness,	{ Silver Medal,	0 16 0
John Currie, Fenwick,	} Practical Examination of Cattle,	{ Silver Medal,	0 16 0
			L.27 8 0

CLASS EXAMINATIONS—JULY 1876.

GLASGOW VETERINARY COLLEGE.

F. F. Insall, Solehill,	} Anatomy,	{ Silver Medal,	0 16 0
Jas. McQueen, Phillipshill,				} Chemistry,	{ Silver Medal,	0 16 0
Jas. McQueen, Phillipshill,	} Botany,	{ Silver Medal,	0 16 0
David Thomson, Bankfoot,			
			L.30 12 0

VII. AGRICULTURAL CLASS EDINBURGH UNIVERSITY.

1. Alexander Sutherland, Ranpyards, Watten, Golspie,	L.6 0 0
2. John Fleming, Coates, Penicuik,	4 0 0
	L.10 0 0

ABSTRACT OF PREMIUMS.

1. ESSAYS AND REPORTS—Money Premiums and Medals,	L.100 0 0
2. GLASGOW SHOW, 1875,	26 2 0
3. ABERDEEN SHOW, 1876—Money Premiums and Medals,	2244 11 6
4. DISTRICT SHOWS:—	
Stock,	L.422 7 6
Special Grants,	133 0 0
Local Societies—Medals in aid of Premiums, given	
by (153),	80 6 0
Ploughing Associations—Medals to (185),	56 8 0
	692 2 0
5. COTTAGES AND GARDENS—Money Premiums and 18 Minor Silver Medals,	
L.18, 188; 18 Medium Silver Medals, L.9, 98,	28 7 0
6. VETERINARY DEPARTMENT—Medals to Students,	30 12 0
7. AGRICULTURAL CHAIR, EDINBURGH UNIVERSITY—Prizes to Class,	10 0 0
	L.5131 14 6

STATE OF THE FUNDS

OF

THE HIGHLAND AND AGRICULTURAL SOCIETY

At 30th NOVEMBER 1876.

I. INVESTMENTS OF BONDS —		
Heritable Bonds,	£16,279	16
Debenture Bond by Trustees of the Clyde Navigation,	1,000	0 0
Railway Debenture Bonds,	6,950	0 0
	<u>£24,229</u>	16 0
II. DEBENTURE STOCK —		
£3,000 North British Railway 4½ per cent. Debenture Stock, at £106, 10s.,	£3,195	0 0
1,000 London and North-Western Railway 4 per cent., at £106, 17s. 6d.,	1,068	15 0
	<u>4,263</u>	15 0
III. VALUE OF BANK STOCKS at 30th November 1876—		
£6,102, 7s. 8d. Royal Bank of Scotland Stock, at £235,	£14,340	12 0
2,218, 6s. 5d. Bank of England Stock, at £256,	5,678	18 0
2,000, 0s. 0d. British Linen Company Bank Stock, at £297,	5,940	0 0
1,250, 0s. 0d. National Bank of Scotland Stock, at £315, 10s.,	3,943	15 0
1,062, 10s. 0d. Commercial Bank of Scotland Stock, at £318,	3,378	15 0
	<u>£33,282</u>	0 0
£12,633, 4s. 1d.		
<i>Note.</i> —The original cost of these Bank Stocks was £18,154, 9s. 8d., showing a profit at present prices of £15,127, 10s. 4d.		
IV TEN SHARES (£500) OF THE BRITISH FISHERY SOCIETY, valued at	200	0 0
V. ARREARS OF MEMBERS' SUBSCRIPTIONS, CONSIDERED RECOVERABLE,	56	19 6
VI. BALANCE DUE BY ROYAL BANK OF SCOTLAND ON CURRENT ACCOUNT,	884	19 4
	<u>£62,917</u>	9 10
AMOUNT OF FUNDS,	<u>£62,917</u>	9 10

VII. BUILDING FUND—

1. Estimated Value of Buildings, No. 3 George IV. Bridge,	£3,100	0	0
2. Sums Invested in Debenture Bonds—			
North British Railway,	£1,000	0	0
Clyde Navigation Trustees,	1,000	0	0
		2,000	0
3. Deposit Receipt with Royal Bank of Scotland,		120	7
		4	
		<u>£5,220</u>	<u>7</u>
			<u>4</u>

VIII. FURNITURE—

Estimated Value of Furniture, Paintings, Books, &c.,	£1,000	0	0
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ANTHONY MURRAY, *Convener of Finance Committee.*

GRAHAM BINNY, *Member of Finance Committee.*

KENNETH MACKENZIE, C.A., *Auditor.*

**ABSTRACT of the ACCOUNTS of the HIGHLAND and
CHARGE.**

1. BALANCE due by Royal Bank of Scotland at 30th November 1875,		£666 8 10
2. Sum in Deposit Receipt with Royal Bank of Scotland, of date 10th November 1875,		1,100 0 0
3. Sum in Deposit Receipt with Royal Bank of Scotland in name of the Building Fund,		39 13 4
4. ARREARS of Annual Subscriptions outstanding at 30th November 1875,		£47 2 6
Whereof due by Members who have since com- pounded for life, and thereby extinguished,	£2 10 0	
Since ordered to be written off as irrecoverable,	23 11 0	
	£26 1 0	
One Member transferred from Ordinary List to Tenant Farmer List, thereby reducing his Arrears from £1, 3s. 6d. to 10s., <i>inde</i> ,	0 13 6	
	26 14 6	
		20 8 0
5. ARREARS from former Shows received—Glasgow, 1875,		7 5 0
6. INCOME FROM INVESTMENTS—		
(1.) Interest on Heritable Bonds—		
On £1,300 at 4½ per cent., £58, 10s.; less tax, 12s. 7d.	£57 17 5	
14,979, 16s. at 4 per cent., £599, 3s. 8d.; less tax, £6, 10s. 2d.,	592 13 6	
£16,279, 16s.	£650 10 11	
(2.) Interest on Debenture Bonds—		
On £7,950 at 4 per cent., £318; less tax, £3, 6s. 3d.,	314 13 9	
(3.) Interest on Debenture Stock—		
On £3,000 North British Railway Company at 4¼ per cent., £127, 10s.; less tax, £1, 6s. 7d.,	£126 3 5	
£1,000 London and North-West- ern Railway Company for half-year at 4 per cent., £20; less tax, 4s. 2d.,	19 15 10	
	145 19 3	
(4.) Interest on Deposits with Royal Bank—		
On £1,100, from 10th November 1875 to 15th May 1876,	£14 15 3	
900, from 13th April to 7th Nov. 1876,	10 5 1	
	25 0 4	
(5.) Interest on Bank Account,		6 1 10
	£1,142 6 1	
(6.) Dividends on Bank Stock—		
£6,102 7 8 Royal Bank of Scotland,	£579 14 8	
2,218 6 5 Bank of England,	199 13 10	
2,000 0 0 British Linen Co. Bank,	260 0 0	
1,250 0 0 National Bank of Scotland,	187 10 0	
1,062 10 0 Commercial Bank of Scot- land,	159 7 6	
	£12,633 4 1	1,386 6 0
(7.) Dividend on £500 Stock of the British Fishery Society. <i>Note.</i> —No Dividend has been received on this Stock for three years.		2,528 12 1
7. INCOME FROM BUILDING FUND—		
Interest on £1,000 Debenture Bond by N. B. Railway Company at 4 per cent., £40; less tax, 8s. 4d.,	£39 11 8	
Interest on £1,000 Debenture Bond by Clyde Naviga- tion Trustees at 4 per cent., £40; less tax, 8s. 4d.,	39 11 8	
Interest on £79, 6s. 8d. on Deposit Receipt with Royal Bank,	1 10 8	
	80 14 0	
8. SUBSCRIPTIONS—		
Annual Subscriptions,	£820 16 6	
Life Subscriptions,	996 1 0	
	1,816 17 6	
9. SUBSCRIPTIONS to Chemical Department,		44 0 0
10. RECEIPTS from Aberdeen Show (exclusive of premiums) per separate States,		1,642 12 3
	£7,946 11 0	
SUM OF CHARGE,		£7,946 11 0

AGRICULTURAL SOCIETY of SCOTLAND for the year 1875-76.

DISCHARGE.

1. ESTABLISHMENT EXPENSES, viz.:—		
Salary to Secretary for year to Martinmas 1876,	£850	0 0
Clerk, £300; Junior Clerk, £147, 10s., for year to 1st October 1876,	447	10 0
Messenger, £72; and allowance to Widow of former Messenger, £21,	93	0 0
	<hr/>	
	£1,390	10 0
Fen-Duty, £28; Taxes, £32, 9s. 8d.; Water Duty, £1, 16s. 8d.,	62	6 4
Coals, £9, 14s.; Gas, £5, 7s. 10d.; Insurance Premiums, £3, 17s. 6d.,	18	19 4
Repairs and Furnishings, £24, 18s. 6d.; Sweeping Vents, 19s. 6d.,	25	18 0
	<hr/>	
	£1,497	13 8
2. FEE to Auditor of Accounts, for year to 30th November 1875,	50	0 0
3. FEE to Practical Engineer, for year to 1st July 1876,	20	0 0
4. AGRICULTURAL CHAIR—		
Grant to Professor Wilson, £150; and Prizes to Class, £10,	160	0 0
5. BURSARY—Mr Alexander Sutherland,	20	0 0
6. VETERINARY DEPARTMENT—		
Allowance to Professor Williams, £26, 5s.; Medals to Students, £30, 12s.,	56	17 0
7. SOCIETY'S TRANSACTIONS—Printing and Binding, £388, 15s. 1d.; less received from sale by Messrs Blackwood, £39, 14s. 11d.,	349	0 2
8. ORDINARY PRINTING, &c.—Printing, £77, 8s.; Lithographing, £43; Advertising, £58, 3s. 1d.; Stationery, £37; Postages, £52; Bank and Post-Office Charges, £4, 3s. 5d.; and Papyrograph, £14, 4s.,	285	18 6
9. TRAVELLING, Hotel Expenses, &c. of Secretary to and from London,	13	19 0
10. SUBSCRIPTIONS to Public Societies—Scottish Meteorological Society, £20; Society for Prevention of Cruelty to Animals, £5,	25	0 0
11. VOTE to Celtic Chair,	105	0 0
12. MISCELLANEOUS PAYMENTS—Reporting General Meetings, £3, 3s.; Handsels, £1, 4s. 6d.; Re-engraving Medals, 14s. 6d.; Sundries, £1, 10s.,	6	12 0
13. PREMIUMS—		
Glasgow, 1875,	£205	12 0
Aberdeen, 1876,	2,090	11 6
District Competitions, 1875,	570	17 0
Ploughing Competitions, 1875-76,	57	0 0
Vote to Edinburgh Christmas Club,	56	2 0
Essays and Reports,	146	2 0
	<hr/>	
	3,125	4 6
14. FEES to Agricultural and Veterinary Examiners, £64, 18s.; and Expenses, £3, 14s.,	68	12 0
15. ARREARS of Subscriptions to be struck off as irrecoverable,	36	15 6
16. ARREARS of Subscriptions considered recoverable,	66	19 6
17. CAPITAL SUM invested in London and North-Western Railway Company 4 per cent. Debenture Stock,	1,062	12 6
18. SUM paid into Deposit with Royal Bank, in name of Building Fund,	120	7 4
19. BALANCE in Royal Bank of Scotland at 30th November 1876,	884	19 4
	<hr/>	
	£7,946	11 0

ANTHONY MURRAY, *Convener of Finance Committee.*
 GRAHAM BINNY, *Member of Finance Committee.*
 KENNETH MACKENZIE, C.A., *Auditor.*

ABSTRACT OF ACCOUNTS—

CHARGE.

1. LOCAL SUBSCRIPTIONS—

Voluntary Assessment on Proprietors—

Aberdeenshire,	£478 11 10
Banffshire,	120 0 0
Kincairdineshire,	0 0 0
Forfarshire (Eastern Division),	300 0 0

£898 11 10

Contribution by Royal Northern Agricultural Society, 100 0 0

£998 11 10

2. AMOUNT COLLECTED DURING SHOW—

Drawn at Gates,	£2,513 11 6
Drawn at Horse Ring,	140 12 6
Catalogues and Awards sold,	245 10 0

2,899 14 0

3. RENT OF STALLS,	913 0 0
4. RENT OF REFRESHMENT BOOTHS,	170 0 0
5. MANURE IN SHOW-YARD SOLD,	15 0 0
6. INTEREST FROM ROYAL BANK,	13 17 4

£5,010 3 2

BALANCE OF PAYMENTS, 447 19 3

£5,458 2 5

Note.—To the above Balance of, £447 19 3

There must be added the Premiums undrawn at 30th November 1876, amounting to £153, and expenses of Implement trials, say £50 203 0 0

Making the probable expense to the Society,

 £650 19 3

ABERDEEN SHOW, 1876.

DISCHARGE.

1. SHOW-YARD EXPENDITURE—		
Fitting up, £1,924. ; Restoring Links after Show, £17, 3s. 4d., and Fee to Master of Works for inspecting the same, £6, 6s. ; Miscellaneous, £4, 19s.,		£1,952 8 4
2. FODDER and Bedding for Stock,		320 9 4
3. POLICE FORCE		37 3 3
4. TRAVELLING EXPENSES of Judges, Secretary, &c.,		200 11 8
5. HOTEL and other Bills for Directors, Judges, Secretary, &c.,		329 18 11
6. TICKETS for President's Dinner for do.,		24 5 0
7. MUSIC in Show-Yard, at Dinner, &c.,		57 3 5
8. PRINTING Catalogues and Awards, and Lithographing Tickets, Badges, &c.,		210 14 0
9. ADVERTISING and Posting Bills,		62 11 6
10. ALLOWANCE to Local Secretary, £21 ; to Practical Engineer, £44, 2s. ; and to Local Veterinary Inspector, £5,		70 2 0
11. ASSISTANTS, Porters, and Attendants,		66 19 5
12. POSTAGE and Receipt Stamps,		24 10 0
13. MISCELLANEOUS OUTLAYS.—Carriage of Catalogues, Boxes, Poultry, &c., £8, 1s. 3d.; Telegrams, £1, 2s. 3d.; Incidental Expenses, £1, 10s. 7d.,		10 14 1
AMOUNT OF GENERAL EXPENSES,		£3,367 10 11
14. PREMIUMS drawn at 30th November 1876,		2,090 11 6
		£5,458 2 5

ANTHONY MURRAY, *Convener of Finance Committee.*

GRAHAM BINNY, *Member of Finance Committee.*

KENNETH MACKENZIE, C.A., *Auditor.*

EDINBURGH, 5th January 1877.

**ABSTRACT of the ACCOUNTS of the
CHARGE.**

1. FUNDS as at 30th November 1875—

LOANS—

On Heritable Bond,	£3,000 0 0
On Debenture Bond by Caledonian Railway Co.,	1,000 0 0

£4,000 0 0

DEBENTURE STOCK of the North British Railway Co.,	1,200 0 0
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£5,200 0 0

BALANCE in Bank at 30th November 1875,	346 1 8
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£5,546 1 8

2. INCOME received—

On £3,000 Heritable Bond at 4 per cent., £120; less Tax, £1, 6s. 1d.,	£118 13 11
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On £1,200 North British Railway Debenture Stock at 4½ per cent., £51; less Tax, 10s. 7d.,	50 9 5
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On £1,000 Debenture Bond by Caledonian Railway Co. at 4 per cent., £40; less Tax, 8s. 4d.,	39 11 8
--	---------

£208 15 0

On Bank Account for year to 30th November 1876,	4 9 3
--	-------

213 4 3

SUM OF CHARGE, £5,759 5 11

ARGYLL NAVAL FUND for 1875-76.

DISCHARGE.

1. ALLOWANCES to the three following Recipients—		
George Pirie, tenth year,	. . . . .	£10 0 0
R. A. J. Montgomerie, fourth year,	. . . . .	40 0 0
Norman Godfrey Macalister, second year,	. . . . .	40 0 0
		<hr/>
		£120 0 0
2. FUNDS as at 30th November 1876—		
LOANS—		
On Heritable Bond,	. . . . . £3,000 0 0	
On Debenture Bond by Caledonian Rail- way Co.,	. . . . . 1,000 0 0	
		<hr/>
		£4,000 0 0
DEBENTURE STOCK of the North British Railway Co.,		. . . . . 1,200 0 0
		<hr/>
		£5,200 0 0
BALANCE in Bank at 30th November 1876,	439 5 11	
		<hr/>
		5,639 5 11
SUM OF DISCHARGE,		<hr/>
		£5,759 5 11

ANTHONY MURRAY, *Convener of Finance Committee.*
 GRAHAM BINNY, *Member of Finance Committee.*
 KENNETH MACKENZIE, C.A., *Auditor.*

EDINBURGH, 5th January 1877.

APPENDIX (B.)

PREMIUMS

OFFERED BY

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND IN 1877.

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GENERAL NOTICE.

THE HIGHLAND SOCIETY was instituted in the year 1784, and established by Royal Charter in 1787. Its operation was at first limited to matters connected with the improvement of the Highlands of Scotland; but the supervision of certain departments, proper to that part of the country, having been subsequently committed to special Boards of management, several of the earlier objects contemplated by the Society were abandoned, while the progress of agriculture led to the adoption of others of a more general character. The exertions of the Society were thus early extended to the whole of Scotland, and have, for the greater part of a century, been directed to the promotion of the science and practice of agriculture in all its branches.

In accordance with this more enlarged sphere of action, the original title of the Society was altered, under a Royal Charter, in 1834, to THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

The leading purposes of the institution are set forth in the following pages, where it will be found that Premiums are offered for Reports on almost every subject connected with the cultivation of the soil, the rearing and feeding of stock; the management of the dairy; the improvement of agricultural machinery and implements; the growth of timber; the extension of cottage accommodation; the application of chemical science; and the dissemination of veterinary information.

Among the more important measures which have been effected by the Society are—

1. Agricultural Meetings and General Shows of Stock, Implements, &c., held in the principal towns of Scotland, at which exhibitors from all parts of the United Kingdom are allowed to compete.

2. A system of District Shows instituted for the purpose of improving the breeds of Stock most suitable for different parts of the country, and of aiding and directing the efforts of Local Agricultural Associations.

3. The encouragement of Agricultural Education, under powers conferred by a supplementary Royal Charter, granted in 1856, and authorising "The Council of the HIGHLAND AND AGRICULTURAL SOCIETY ON EDUCATION" to grant Diplomas to Students of Agriculture; and by the establishment of Bursaries.

4. The establishment of Agricultural Stations for the purpose of promoting the application of science to agriculture, and the appointment of a Chemist to superintend all experiments conducted at these Stations, and prepare a Report of the same to be published in the Transactions.

5. The advancement of the Veterinary Art, by conferring Certificates on Students who have passed through a prescribed curriculum, and who are found, by public examination, qualified to practise.

6. The appointment of a Board of Examiners, and the granting of First and Second Class Certificates in Forestry.

7. The annual publication of the Transactions, which comprehend the Prize-Reports, and reports of experiments, also an abstract of the business at Board and General Meetings, and other communications.

8. The management of a fund left by John, 5th Duke of Argyll (the original President of the Society), to assist young natives of the Highlands who enter Her Majesty's Navy.

CONSTITUTION AND MANAGEMENT.

The general business of THE HIGHLAND AND AGRICULTURAL SOCIETY is conducted under the sanction and control of a Royal Charter, which authorises the enactment of Bye-Laws. Business connected with Agricultural Education is conducted under the authority of a Supplementary Royal Charter, also authorising the enactment of Bye-Laws.

The Office-Bearers consist of a President, Four Vice-Presidents, Thirty Ordinary and Ten Extraordinary Directors, a Treasurer, an Honorary and an Acting Secretary, an Auditor, and other Officers.

The Directors meet on the first Wednesday of each month from November to June. The proceedings of the Directors are reported to General Meetings of the Society, held in January and in June or July.

With reference to motions at General Meetings, Bye-Law No. 7 provides—“That at General Meetings of the Society no motion or proposal (except of mere form or courtesy) shall be submitted or entertained for immediate decision unless notice thereof has been given a week previously to the Board of Directors, without prejudice, however, to the competency of making such motion or proposal to the effect of its being remitted to the Directors for consideration, and thereafter being disposed of at a future General Meeting.”

The Council on Education, under the Supplementary Charter, consists of Sixteen Members—Nine nominated by the Charter, and Seven elected by the Society. The Board of Examiners consists of Ten Members.

Candidates for admission to the Society must be proposed by a Member, and are elected at the half-yearly General Meetings in January and June or July. The ordinary subscription is L.1, 3s. 6d. annually, which may be redeemed by one payment, varying, according to the number of previous annual payments, from L.12, 12s. to L.7, 1s. Proprietors farming the whole of their own lands, whose assessment on the valuation Roll does not exceed L.500 per annum, and all Tenant-Farmers, Office-Bearers of Local Agricultural Associations, Resident Agricultural Factors, Land Stewards, Foresters, Agricultural Implement Makers, and Veterinary Surgeons, none of them being also owners of land to an extent exceeding L.500 per annum, are admitted on a subscription of 10s. annually, which may be redeemed by one payment, varying, according to the number of previous annual payments, from L.5, 5s. to L.3. According to the Charter, a Member who homologates his Election by paying his first subscription cannot retire until he has paid in annual subscriptions, or otherwise, an amount equivalent to a life composition. Members having Candidates to propose are requested to state whether the Candidate should be on the L.1, 3s. 6d. or 10s. list.

Members of the Society receive the Transactions free on application to the Secretary, and are entitled to apply for District Premiums—to report Ploughing Matches for the Medal—to attend Shows free of charge, and to exhibit Stock at reduced rates.

Orders, payable at the Royal Bank of Scotland, Edinburgh, are issued by the Directors, in name of the parties in whose favour Premiums have been awarded.

All communications must be addressed to “FLETCHER NORTON MENZIES, Esq., Secretary of the Highland and Agricultural Society of Scotland, No. 3 GEORGE IV. BRIDGE, EDINBURGH.”

ESTABLISHMENT FOR 1877.

President.

THE MOST NOBLE THE MARQUIS OF LOTHIAN, Newbattle Abbey, Dalkeith.

Vice-Presidents.

The Most Noble the Marquis of TWEEDDALE, Yester, Haddington.
The Right Hon. the Earl of HADDINGTON, Tynninghame, Prestonkirk.
Colonel INNES of Learney, Torplains.
The Right Hon. the Earl of WEMYSS and MARCH, Gosford, Haddington.
The Right Hon. the Earl of ROSEBERY, Dalmeny Park, Edinburgh.

Ordinary Directors.

JOHN DOVE, Eastfield, Greenlaw, Dunse.
H. D. ERSKINE of Cardross, Stirling.
ROBERT HUTCHISON of Carlowrie, 29 Chester Street, Edinburgh.
Colonel INNES of Learney, Torplains.
BRYDEN MONTEITH, Tower Mains, Liberton.
ROBERT STEWART of Ingliston, Ratho.
ROBERT WILSON, Durn, Perth.
The Hon. GREVILLE R. VERNON, Auchans House, Kilmarnock.
Sir ALEXANDER JARDINE of Applegarth, Bart., Jardine Hall, Lockerbie.
ROBERT FINDLAY of Springhill, Bailieston.
THOMAS D. FINDLAY of Easterhill, Tolleross, Glasgow.
CHARLES HOWATSON of Dornel, Daldorch House, Matchline.
JOHN M. MARTIN, jr. of Auchendeman, Bloomhill, Cardross.
WILLIAM S. WALKER of Bowland, C.B., 125 George Street, Edinburgh.
Sir JOHN MARJORIBANKS of Lees, Bart., Coldstream.
JAMES COCHRANE, Little Haddo, Newburgh, Aberdeen.
ROBERT COPLAND, Mill of Adlethen, Ellon.
THOMAS FERGUSON, Kinnochtry, Coupar-Angus.
ANDREW GILLON of Wallhouse, Bathgate.
ALEXANDER FORBES IRVINE of Drum, 25 Castle Terrace, Edinburgh.
JAMES TOWNSEND OSWALD of Dumnickier, Kirkcaldy.
ADAM SMITH, Stevenson Mains, Haddington.
Sir GEORGE DOUGLAS CLEEK of Penienik, Bart., Penienik.
Sir JAMES R. GIBSON MAITLAND of Clifton Hall, Bart., Ratho.
THOMAS A. HOG of Newliston, Kirkliston.
ANTHONY MURRAY of Dolerie, 111 George Street, Edinburgh.
THOMAS MYLNE, Niddrie Mains, Liberton.
WILLIAM RITCHIE of Middleton, Gorebridge.
CHARLES SMITH, Whittinghame, Prestonkirk.
Captain W. J. WATCHOPE of Niddrie Marischal, Liberton.

Extraordinary Directors.

The Right Hon. Sir JAMES FALSHAW, Bart., Lord Provost of Edinburgh.
 The Right Hon. the Earl of DALKEITH, K.T., M.P., Dalkeith House, Dalkeith.
 The Right Hon. Lord ELCHO, M.P., 23 St James' Place, London.
 The Hon. CHARLES HOPE of Bridge Castle, Bathgate.
 Sir HEW DALRYMPLE of North Berwick, Bart., Luchie, North Berwick.
 Sir WILLIAM BAILLIE of Polkemmet, Bart., Whitburn.
 ARTHUR JAMES BALFOUR of Whittinghame, M.P., Prestonkirk.
 ROBERT BRYSON, Master of the Merchant Company, Edinburgh.
 ROBERT DUNDAS of Arniston, Gorebridge.
 PETER M'LAGAN of Pumpherston, M.P., Almondell, Mid-Calder.

Office-Bearers.

The Right Hon. Sir WILLIAM GIBSON-CRAIG, of Riccarton, Bart., *Treasurer*.
 Sir WILLIAM STIRLING-MAXWELL of Polloc, Bart., K.T., M.P., *Hon. Secretary*.
 FLETCHER NORTON MENZIES, *Secretary*.
 Rev. JAMES GRANT, D.C.L., D.D., *Chaplain*.
 ANDREW P. AITKEN, Sc.D., *Chemist*.
 KENNETH MACKENZIE, C.A., *Auditor*.
 MURRAY & FALCONER, W.S., *Law Agents*.
 JOHN WILSON, University of Edinburgh, *Professor of Agriculture*.
 JOHN HUTTON BALFOUR, M.D., F.R.S., Univ. of Edin., *Professor of Botany*.
 DAVID STEVENSON, F.R.S.E., M.I.C.E., *Consulting Engineer*.
 JAMES D. PARK, *Practical Engineer*.
 THOMAS DUNCAN, *Recorder and Clerk*.
 JOHN MACDIARMID, *Junior Clerk*.
 GOURLAY STEELL, R.S.A., *Animal Portrait Painter*.
 WILLIAM WILLIAMS, M.R.C.V.S., *Professor of Veterinary Surgery*.
 THOMAS WALLEY, M.R.C.V.S., *Professor of Cattle Pathology*.
 WILLIAM BLACKWOOD & SONS, *Publishers*.
 NEILL & COMPANY, *Printers*.
 G. WATERSTON, SONS, and STEWART, *Stationers*.
 MACKAY, CUNNINGHAM, & Co., *Silversmiths*.
 ALEXANDER KIRKWOOD & SON, *Medallists*.
 JOHN WATHERSTON & SONS, *Inspectors of Works*.
 WILLIAM SIMPSON, *Messenger*.

Chairmen of Committees.

1. *Agricultural Reports*, . . . WILLIAM S. WALKER of Bowland, C.B.
2. *Argyll Naval Fund*, . . . Admiral Sir WM. J. HOPE JOHNSTONE, K.C.B.
3. *Chemical Department*, . . . C. J. MACKENZIE of Portmore, Eddleston.
4. *Cottages*, HARRY MAXWELL INGLIS of Loganbank.
5. *District Shows*, A. CAMPBELL SWINTON of Kimmerhame, Dunse.
6. *Finance*, ANTHONY MURRAY of Dollerie.
7. *Forestry Department*, . . . Professor BALFOUR.
8. *General Shows*, ANDREW GILLON of Wallhouse, Bathgate.
9. *Hall and Chambers*, . . . JOHN ORD MACKENZIE of Dolphinton.
10. *Law*, GRAHAM BINNY, W.S.
11. *Machinery*, JAMES W. HUNTER of Thurston, Dunbar.
12. *Ordnance Survey*, ROBERT DUNDAS of Arniston, Gorebridge.
13. *Publications*, ALEXANDER FORBES IRVINE of Drum.
14. *Steam Cultivation*, . . . The Marquis of LOTHIAN.
15. *Veterinary Department*, . . . Captain TOD of Howden, Mid-Calder.

COMMITTEES FOR 1877.

1. AGRICULTURAL REPORTS.

WILLIAM S. WALKER of Bowland, C.B., *Convener*.
 Professor BALFOUR, Edinburgh.
 „ WILSON, Edinburgh.
 ALEXANDER FORBES IRVINE of Drum.
 ROBERT SCOT SKIRVING, 29 Drummond Place, Edinburgh.
 P. B. SWINTON, Holyn Bank, Gifford.
 ROBERT HUTCHISON of Carlowrie.
 THOMAS MYLNE, Niddrie Mains, Liberton.

2. ARGYLL NAVAL FUND.

Admiral Sir WILLIAM J. HOPE JOHNSTONE, K.C.B., *Convener*.
 GRAHAM BINNY, W.S., Edinburgh.
 HEW CRICHTON, S.S.C., Edinburgh.
 Admiral MAITLAND DOUGALL of Scotsraig, R.N.

3. CHEMICAL DEPARTMENT.

C. J. MACKENZIE of Portmore, Eddleston, *Convener*.
 Professor DOUGLAS MACLAGAN, Edinburgh.
 „ BALFOUR, Edinburgh.
 „ WILSON, Edinburgh.
 JAMES MELVIN, Bonnington, Ratho.
 P. B. SWINTON, Holyn Bank, Gifford.
 ROBERT HUTCHISON of Carlowrie.
 BRYDEN MONTEITH, Tower Mains, Liberton.
 DAVID MILNE HOME of Milnegraden.
 JOHN MUNRO, Fairmington, Kelso.
 ADAM SMITH, Stevenson Mains, Haddington.
 THOMAS FERGUSON, Kinlochtry, Coupar-Angus.
 JAMES COCHRANE, Little Haddo, Newburgh, Aberdeen.
 THOMAS MYLNE, Niddrie Mains, Liberton.
 WILLIAM RITCHIE of Middleton, Gorebridge.
 CHARLES SMITH, Whittinghame, Prestonkirk.
 Dr ANDREW P. AITKEN, 3 George IV. Bridge, Edinburgh, *Chemist*.

4. COTTAGES.

HARRY MAXWELL INGLIS of Loganbank, *Convener*.
 The MARQUIS of HUNTLY.
 JOHN ORD MACKENZIE of Dolphinton.
 ARCHIBALD CAMPBELL SWINTON of Kimmerghame, Dunse.
 C. J. MACKENZIE of Portmore, Eddleston.
 Captain WAUCHOPE of Niddrie Marischal.

5. DISTRICT SHOWS.

ARCHIBALD CAMPBELL SWINTON of Kimmerghame, *Convener*.
 Sir THOMAS BUCHAN HEPBURN of Smeaton, Bart.
 THOMAS MYLNE, Niddrie Mains, Liberton.
 ALEXANDER YOUNG, Keir Mains, Dunblane.
 ANDREW MITCHELL, Alloa.
 CHARLES HOWATSON of Dornel, Daldorch House, Mauchline.
 Sir ALEXANDER JARDINE of Applegarth, Bart., Jardine Hall, Lockerbie.
 ADAM SMITH, Stevenson Mains, Haddington.
 Sir GEORGE D. CLERK of Penicuik, Bart.

6. FINANCE.

ANTHONY MURRAY of Dollerie, *Convener*.
 Right Hon. Sir WILLIAM GIBSON-CRAIG of Riccarton, Bart.
 HEW CRICHTON, S.S.C., Edinburgh.
 THOMAS A. HOG of Newliston, Kirkliston.
 GRAHAM BINNY, W.S., Edinburgh.
 WILLIAM S. WALKER of Bowland, C.B.
 ROBERT STEWART of Ingliston, Ratho.
 GEORGE AULDJO JAMIESON, C.A., Edinburgh.
 JAMES D. PARK, Greenside Lane, Edinburgh, *Practical Engineer.*"

7. FORESTRY DEPARTMENT.

Professor BALFOUR, Edinburgh, *Convener*.
 ,, WILSON, Edinburgh.
 Dr CLEGHORN, Stravithy, St Andrews.
 ALEXANDER FORBES IRVINE of Drum.
 ROBERT P. NEWTON of Castlandhill, Polmont Bank, Falkirk.
 ROBERT HUTCHISON of Carlowrie.
 C. J. MACKENZIE of Portmore, Eddleston.
 H. D. ERSKINE of Cardross, Stirling.
 THOMAS A. HOG of Newliston, Kirkliston.

8. GENERAL SHOWS.

ANDREW GILLON of Wallhouse, *Convener*.
 Sir GEORGE MACPHERSON GRANT of Ballindalloch, Bart.
 DAVID STEVENSON, C.E., Edinburgh.
 Professor WILSON, Edinburgh.
 THOMAS MYLNE, Niddrie Mains, Liberton.
 ALEXANDER YOUNG, Keir Mains, Dunblane.
 WILLIAM FORD, Hardengreen, Dalkeith.
 ANDREW MITCHELL, Alloa.
 JAMES W. HUNTER of Thurston, Dunbar.
 THOMAS D. FINDLAY of Easterhill, Tolleross, Glasgow.
 CHARLES HOWATSON of Dornel, Daldorch House, Manchainie.
 J. M. MARTIN, jr. of Auchendennan, Bloomhill, Cardross.
 ALEXANDER FORBES IRVINE of Drum.
 ROBERT COPLAND, Mill of Ardlathen, Ellon.
 JAMES COCHRANE, Little Haddo, Newburgh, Aberdeen.
 THOMAS FERGUSON, Kinnochtry, Coupar-Angus.
 ROBERT HUTCHISON of Carlowrie.
 CHARLES SMITH, Whittinghame, Prestonkirk.

9. HALL AND CHAMBERS.

JOHN ORD MACKENZIE of Dolphinton, *Convener*.
 Sir JAMES GARDINER BAIRD of Saughton Hall, Bart.
 ANTHONY MURRAY of Dollerie.
 GRAHAM BINNY, W.S., Edinburgh.
 ADAM CURROR, The Lee, Edinburgh.
 DAVID STEVENSON, C.E., Edinburgh.
 WILLIAM S. WALKER of Bowland, C.B.

10. LAW.

GRAHAM BINNY, W.S., Edinburgh, *Convener*.
 JOHN ORD MACKENZIE of Dolphinton, W.S., Edinburgh.
 WILLIAM S. WALKER of Bowland, C.B.
 ANTHONY MURRAY of Dollerie, W.S., Edinburgh.
 HEW CRICHTON, S.S.C., Edinburgh.
 GEORGE AULDJO JAMIESON, C.A., Edinburgh.

II. MACHINERY.

JAMES W. HUNTER of Thurston, *Convener*.
 SIR ALEXANDER JARDINE of Applegarth, Bart., Jardine Hall, Lockerbie.
 DAVID STEVENSON, C.E., Edinburgh.
 Professor WILSON, Edinburgh.
 THOMAS MYLNE, Niddrie Mains, Liberton.
 PATRICK SMALL KEIR of Kindrogan, Pitlochry.
 JOHN MUNRO, Fairnington, Kelso.
 P. B. SWINTON, Holyn Bank, Gifford.
 C. J. MACKENZIE of Portmore, Eddleston.
 ROBERT HUTCHISON of Carlowrie.
 THOMAS D. FINDLAY of Easterhill, Tolleross, Glasgow.
 BRYDEN MONTEITH, Tower Mains, Liberton.
 GEORGE ROBERTSON of Hedderwick, C.E., 47 Albany Street, Edinburgh.
 JAMES D. PARK, Greenside Lane, Edinburgh, *Practical Engineer*.

12. ORDNANCE SURVEY.

ROBERT DUNDAS of Amiston, *Convener*.
 C. J. MACKENZIE of Portmore, Eddleston.
 WILLIAM S. WALKER of Bowland, C.B.

13. PUBLICATIONS.

ALEXANDER FORBES IRVINE of Drum, *Convener*.
 Professor BALFOUR, Edinburgh.
 WILLIAM S. WALKER of Bowland, C.B.
 ROBERT P. NEWTON of Castlandhill, Polmont Bank, Falkirk.
 ROBERT HUTCHISON of Carlowrie.

14. STEAM CULTIVATION.

The Marquis of Lothian, *Convener*.
 Hon. GEORGE WALDEGRAVE-LESLIE, Leslie House, Leslie.
 SIR THOMAS BUCHAN HEPBURN of Smeaton, Bart., Prestonkirk.
 DAVID STEVENSON, C.E., Edinburgh.
 Professor WILSON, Edinburgh.
 J. W. HUNTER of Thurston, Dunbar.
 THOMAS MYLNE, Niddrie Mains, Liberton.
 P. B. SWINTON, Holyn Bank, Gifford.
 JOHN DOVE, Eastfield, Greenlaw, Dunse.
 JOHN MUNRO, Fairnington, Kelso.

15. VETERINARY DEPARTMENT.

Captain TOD of Howden, *Convener*.
 Hon. G. R. VERNON, Auchans House, Kilmarnock.
 ANDREW GILLON of Wallhouse, Bathgate.
 WILLIAM S. WALKER of Bowland, C.B.
 ALEXANDER KINLOCH, jr. of Gilmerton, Drem.
 THOMAS MYLNE, Niddrie Mains, Liberton.
 ALEXANDER M'DOGGAL, Geinton Mains, Edinburgh.
 THOMAS A. HOG of Newliston, Kirkliston.
 ADAM SMITH, Stevenson Mains, Haddington.
 Captain WAUCHOPE of Niddrie Marischall.

SPECIAL COMMITTEES.

1. *Entomological Specimens*.—Robert Scot Skirving, Edinburgh, *Convener*;
 Professor Wilson; Professor Sir C. Wyville Thomson; John Wilson, Edington
 Mains, Chirnside.

2. *Transit of Stock*.—Patrick Dudgeon of Cargen, Dumfries, *Convener*; Graham Binny, W.S.; Andrew Gillon of Wallhouse, Bathgate; Alex. Kinloch, yr. of Gilmerton, Dren; R. P. Newton of Castlandhill; John Ord of Muirhouselaw; W. S. Walker of Bowland, C.B.; Archibald Campbell Swinton of Kimmerghame, Dunse; Alex. F. Irvine of Drum; David Milne Home of Milnegraden.

The President, Vice-Presidents, Treasurer, and Honorary Secretary, are members *ex officio* of all Committees.

AGRICULTURAL EDUCATION.

CERTIFICATES AND DIPLOMA IN AGRICULTURE.

COUNCIL ON EDUCATION.

By a Supplementary Charter under the Great Seal, granted in 1856, the Society is empowered to grant Diplomas.

Members of Council named by Charter.

The PRESIDENT of the HIGHLAND AND AGRICULTURAL SOCIETY—*President*.

The LORD JUSTICE-GENERAL—*Vice-President*.

The LORD ADVOCATE.

The DEAN OF FACULTY.

The PROFESSOR OF AGRICULTURE.

The PROFESSOR OF ANATOMY.

The PROFESSOR OF BOTANY.

The PROFESSOR OF CHEMISTRY.

The PROFESSOR OF NATURAL HISTORY.

Members of Council nominated by Society.

The DUKE OF BUCCLEUCH, K.G.

Sir WILLIAM GIBSON-CRAIG, Bart.

JOHN WILSON, Edington Mains.

THOMAS MYLNE, Niddrie Mains.

JAMES W. HUNTER of Thurston.

ROBERT DUNDAS of Arniston.

JOHN MUNRO, Fairnington.

Board of Examiners.

1. *Science and Practice of Agriculture—Mechanics and Construction*.—Professor WILSON; JOHN WILSON, Edington Mains; THOMAS MYLNE, Niddrie Mains, and JOHN MUNRO, Fairnington, Kelso.
2. *Botany*.—Professor BALFOUR.
3. *Chemistry*.—Dr A. P. AITKEN.
4. *Natural History*.—Professor Sir C. WYVILLE THOMSON.
5. *Veterinary Surgery*.—Professor WILLIAMS.
6. *Field Engineering and Surveying*.—DAVID STEVENSON, C.E.
7. *Book-keeping and Accounts*.—KENNETH MACKENZIE, C.A.

Standing Acting Committee.

The LORD JUSTICE-GENERAL—*Convener*.

The PROFESSOR OF AGRICULTURE.

The PROFESSOR OF BOTANY.

The PROFESSOR OF CHEMISTRY.

THOMAS MYLNE, Niddrie Mains.

JAMES W. HUNTER of Thurston.

JOHN MUNRO, Fairnington.

BYE-LAWS.

I. That, in terms of the Charter, the Society shall nominate seven members to act on the Council on Education.

II. That the Council shall appoint a Board of Examiners on the following subjects:—Science and Practice of Agriculture, Mechanics and Construction; Botany; Chemistry; Natural History; Veterinary Surgery; Field Engineering and Surveying; and Book-keeping and Accounts.

III. That the examinations shall be both written and oral, that the value of the answers shall be determined by numbers, and that the oral examinations shall be public.

IV. That there shall be three Examinations,* to be styled respectively the “Second Class Certificate Examination,” the “First Class Certificate Examination,” and the “Diploma Examination.” The first to be open to candidates not less than seventeen years of age; the second to those who are not less than eighteen; and the third to those who have completed their twenty-first year.

V. That to pass the “Second Class Certificate Examination,” a candidate must be acquainted with the principles and practice of agriculture, agricultural chemistry, surveying and farm engineering, and farm accounts; and that a certificate in the following terms, signed by the President or Vice-President of the Council on Education, the Examiners, and by the Secretary, shall be granted to candidates passing this examination:—

“We hereby certify that on the _____ day of _____ A. B. was examined, and has been found to possess a knowledge of agriculture, agricultural chemistry, surveying and farm engineering, and farm accounts.”

VI. That to pass the “First Class Certificate Examination” a candidate must be acquainted with the subjects of the second class certificate and any three of the following subjects:—Botany, geology, physics or mechanics, meteorology or climate, natural history, and veterinary practice; and that a certificate in the following terms, signed by the President and Vice-President of the Council on Education, the Examiners, and by the Secretary, shall be granted to candidates passing this examination:—

“We hereby certify that on the _____ day of _____ A. B. was examined, and has been found to possess a knowledge of agriculture, agricultural chemistry, surveying and farm engineering, and farm accounts.”

VII. That to pass the “Diploma Examination” a candidate must have attained his twenty-first year, and must possess a thorough knowledge of the theory and practice of agriculture, of mechanics and mensuration, of the physiology and treatment of domesticated animals, and of the application of botany, chemistry, and natural history to agriculture; and that a diploma in the following terms, bearing the corporate seal of the Society, and signed by the President or Vice-President of the Council on Education, the Examiners, and by the Secretary, shall be granted to candidates passing this examination:—

“These are to certify that, on the _____ day of _____ A. B. was examined in the arts and sciences connected with agriculture, and has been reported to be proficient therein by a Board of Examiners nominated by the Council of the Highland and Agricultural Society of Scotland on Education, in terms and by authority of a charter given under the great seal on the 18th day of August 1856.”

* It has been resolved that, under ordinary circumstances, the Examinations shall be held annually in the end of March, candidates being required to lodge intimation before the 10th of that month.

VIII. That each successful candidate for the Society's Agricultural Diploma shall thereby become eligible to be elected a free life member of the Society.

IX. That the Society shall grant annually ten bursaries of L.20 each; and five of L.10 each, to be competed for by pupils of schools to be approved of by the Directors, which include or are willing to introduce the teaching of chemistry, and the following branches of natural science—physical geography, botany, and geology, into their curriculum.

X. That the L.20 bursaries shall be tenable for one year at the University of Edinburgh, for the purpose of enabling the holders to take the classes necessary to qualify for the Society's Certificate or Diploma; and the L.10 bursaries to be tenable for the same period to enable the holders to receive another year's preparation at the schools.

XI. That the bursaries shall be determined by examination held in Edinburgh by the Society's Examiners.

XII. That a Standing Acting Committee of the Council on Agricultural Education shall be appointed by the Directors.

SYLLABUS OF EXAMINATION

FOR CERTIFICATES AND DIPLOMA.

I.—SCIENCE AND PRACTICE OF AGRICULTURE, MECHANICS, AND CONSTRUCTION.

1. The principles of rotation. Rotations of cropping in most common use for heavy and for light soils. 2. Manures in ordinary use—usual quantities applied per acre—time and mode of application—their composition and relative values and uses. 3. Composition and classification of soils—their agricultural treatment. 4. The various farm crops—their cultivation, general treatment, and marketable value—ordinary produce per acre, and the different modes of storing them. 5. The breeding, rearing, feeding, and humane treatment of the live stock of the farm—the different breeds—their characteristics—the districts where they are principally met with—and also the best and most humane system of horse-breaking. 6. Drainage operations. 7. The implements used in agriculture, the points to be attended to in their construction and use, and their prices. Text-books—Stephen's "Book of the Farm," William Blackwood & Sons; price 50s. Morton's "Cyclopædia of Agriculture," Blackie & Son, Glasgow; price 50s. Roscoe's "Lessons in Elementary Chemistry," Macmillan & Co., London; price 4s. 6d. Lindley's, Henfrey's (4s. 6d.), or Balfour's (3s. 6d.) "Botany." Page's "Geological Text-Book;" price 7s. 6d.

II.—BOTANY.

1. Nutritive Organs of Plants—root, stem, leaves. Functions of roots. Various kinds of stems, with examples. Use of the stem. Structure of leaves. Different kinds of leaves. Arrangement and functions of leaves. 2. Reproductive Organs—Flower and its parts. Arrangements of the whorls of the flower—calyx, corolla, stamens, pistil. Ovule. Mature pistil or fruit. Pruning and grafting. Seed. Young plants or embryo. Sprouting of the seed, or germination. 3. General Principles of Classification—meaning of the terms Class, Order, Genus, Species. Illustrations taken from plants used in agriculture, such as grain-crops, grasses, clovers, vetches, turnips, mangold-wurzel, pease, beans, &c. Practical Examination in fresh Specimens and Models; some of the latter may be seen in the Museum, at the Royal Botanic Garden, which is open daily to the public, free. Text-book—Balfour's "Elements of Botany," A. & C. Black, 1876; price 3s. 6d.

III.—CHEMISTRY.

1. CHEMISTRY.

The laws of chemical combination. Atomic theory. Chemistry of the non-metallic elements, and their more important compounds. Potassium, sodium, calcium, magnesium, iron, and their compounds. Text-book—Roscoe's "Lessons in Elementary Chemistry," Macmillan & Co., London; price 4s. 6d.

2. AGRICULTURAL CHEMISTRY.

Composition of Plants. Their organic and inorganic constituents. Composition and characters of fertile soils. The principles of manuring. Composition of farm-yard manure. Artificial manures. Their nature and composition. Principles on which they should be used. Feeding stuffs. Their composition and value, and the mode in which they may be most advantageously employed. Text-books—Anderson's "Elements of Agricultural Chemistry," A. & C. Black, Edinburgh; price 6s. 6d. Johnson's "How Crops Grow," Macmillan & Co., London.

IV.—NATURAL HISTORY.

1. ZOOLOGY.

1. The Primary Divisions of the Animal Kingdom, with examples of each. 2. The Vertebrate Kingdom. The peculiarities and functions of the alimentary canal, distinguishing the Ruminants. 3. The Orders—Hymenoptera, Diptera, and Coleoptera—with examples of insects injurious to farm crops belonging to each of the Orders—the preservation of birds which prey upon these insects, drawing a distinction between those which are beneficial and those which are destructive to crops. Text-book—Nicholson's "Introductory Text-Book of Zoology," William Blackwood & Sons, Edinburgh and London.

2. GEOLOGY.

4. The various strata forming the earth's crust in their order of deposition. 5. Their influences on the surface soils of the country. 6. The meaning and application of Disintegration, Drift, Alluvium, Dip, Strike, Fault. Page's "Introductory Text-book of Geology;" and Lyell's Students' "Elements of Geology."

V.—VETERINARY SURGERY.

1. Anatomy of the digestive organs of horse and ox, describing their structural differences. 2. The process of digestion in the above animals, and food most proper for each in quantity and quality. 3. The management of stock before, at, and after parturition. The time of utero-gestation in the domesticated animals. 4. The general principles to be followed in the treatment of very acute disease, before assistance of the veterinary surgeon can be procured.

VI.—FIELD ENGINEERING AND SURVEYING.

1. Land-Surveying with the Chain. 2. Mensuration of Areas of Land from a Chain Survey or from a Plan. 3. Levelling with the ordinary Levelling Instrument and Staff. Text-books—Any one of the following:—Butler Williams' "Practical Geodesy," J. W. Parker, London; price 8s. 6d.; pages 1 to 24, 24 to 28, 29 to 33, 56 to 59, 118 to 132. "Cassell on Land-Surveying," Cassell, Petter, & Galpin, London; or "Bruff on Land-Surveying," Simpkin & Marshall, London; the parts which relate to chain-surveying and ordinary levelling only.

VII.—BOOK-KEEPING AND ACCOUNTS.

1. Questions in practice and proportion. 2. Book-keeping—Describe books to be kept; give examples—taking of stock. Text-book—Stephen's "Practical System of Farm Book-keeping," Wm. Blackwood & Sons, Edinburgh; price 2s. 6d.

* *The following have passed Examinations:—*

FOR DIPLOMA.

1. JACOB WILSON, M.R.A.C., Woodhorn Manor, Morpeth,	1858
2. JOHN MILNE, Mains of Laithers, Turiff.	1859
3. WILLIAM HENRY ELEY, Islingham, Frindsbury, Rochester, Kent,	1859
4. THOMAS ROME, M.R.A.C., Northampton Downs, Barcoo River, Queensland,	} 1859
5. WILLIAM NORMAN, M.R.A.C., Hall Bank, Aspatria,	
6. GEORGE CAMPBELL, Kilkea Farm, Mageney Cottage, Kildare.	1861
7. WILLIAM B. SMITH, M.R.A.C., Stoneleigh Villa, Leamington,	1862
8. <i>John R. Hetherington, M.R.A.C., Carleton, Carlisle,</i>	1862
9. WILLIAM BROWN, Factor, Earlsmill, Forres,	1864
10. ARTHUR JAMES HILL, M.R.A.C., Accountant, London,	1864
11. H. R. GODDARD, M.R.A.C., Belsay, Newcastle-on-Tyne,	1866
12. G. Y. WALL, M.R.A.C., Durham,	1866
13. ROBERT BRYDON, The Dene, Seaham Harbour.	1867
14. GEORGE KENT WALTON, Long Campton, Shipston-on-Stour,	1867
15. THOMAS JOHN ELLIOT, M.R.A.C., Wilton, Salisbury,	1868
16. JOHN GERRARD, Veterinary Infirmary, Market Deeping,	1869
17. COLVILLE BROWNE, M.R.A.C., Park House, Long Melford, Suffolk,	1872
18. A. H. ASHDOWN, M.R.A.C., Uppington, Salop,	1872
19. ADAM OGILVIE TORRY, St Anne's, Coupar-Angus,	1872
20. ITALO GIGLIOLI, M.R.A.C., Florence,	1873
21. EDWARD CHARLES MUNBY, M.R.A.C., Myton Grange, Helperby, Yorkshire,	} 1873
22. R. F. JUCKES, M.R.A.C., Cotwall, Wellington, Salop,	
23. FORBES BURN, Hardacres, Coldstream,	1874
24. HENRY ERSKINE, Dalladies, Brechin,	1874
25. RICHARD HENDERSON, Coldstream,	1874
26. WILLIAM KENNEDY, M.R.A.C., 89 Marine Parade, Brighton,	1875
27. THOS. COKER BECK, M.R.A.C., Foleshill, Coventry.	1875
28. GEORGE BURN MURDOCH, M.R.A.C., Greenhill Lodge, Edin.,	1875
29. R. W. E. MURRAY, Wester House Byres, Galashiels,	1875
30. R. LANG ANDERSON, Milliken Park, Renfrewshire,	1876
31. ARCHD. A. FERGUSON, Gosfield, Essex,	1876
32. JOHN ARTHUR MACONCHY, Rathmore, Auchnaccliffe, Co. Longford,	1876
33. ALEXANDER SUTHERLAND, Rampyards, Watten, Golspie,	1876

FOR 1ST CLASS CERTIFICATE.

1. J. C. BOWSTEAD, M.R.A.C., Halkthorpe Hall, Penrith,	1867
2. JAMES TAYLOR, Allan Vale, Pitmuxton,	1868
3. R. C. BRUCE WILLIS, M.R.A.C., 8 Lansdowne Crescent, Cheltenham,	} 1873
4. JOHN BRAMWELL, Blackaddie, Sanquhar,	
5. GEORGE HENRY CATT, 44 Middle Street, Brighton,	1875
6. ROBERT EWING, Reporter, Edinburgh,	1875
7. JOHN SCOTT, Howford, Selkirk,	1875

* Names of those deceased, so far as known, are printed in italics.

8. CECIL C. BAKER, 2 Bloomsbury Place, London,	1876
9. ROBERT CARR, Felkington, Norham,	1876
10. PERCY H. CATHCART, 16 Oakley Square, London,	1876
11. JOHN M'CAIG, Kilhilt, Stranraer,	1876
12. C. E. M. RUSSELL, Ballielisk, Dollar,	1876

FOR SECOND CLASS CERTIFICATE.

1. ANDREW CATTON, Couston, Aberdour, Fife,	1876
2. JOHN FLEMING, Coates, Penicuik,	1876
3. JOHN J. SHARP, Leaston, Upper Keith,	1876

EXAMINATION FOR BURSARIES.

Candidates are examined in the Elements of Botany, Chemistry, Physical Geography, and Geology. Text-Books—Balfour's "Elements of Botany;" Roscoe's "Lessons in Elementary Chemistry;" Page's "Introductory Text-book of Geology;" and Geikie's "Primer of Physical Geography;" Lyell's "Students' Elements of Geology."

It has been resolved that, under ordinary circumstances, the Examinations shall be held annually in the end of October, and Candidates must enter their names with the Secretary before the 10th of that month, and produce the necessary certificates from the teachers of the schools they have attended.

The following have passed Examinations:—

FOR BURSARY OF L.20.

1. ALEXANDER SUTHERLAND, Rampyards, Watten, Golspie, Gersay } School,	1875
2. ROBERT LYALL, Catchery, Watten, Golspie, Gersay School,	1876
3. WILLIAM REEKIE, Walton, Auchtertool, Fifeshire, Dollar } Institution,	1876

FOR BURSARY OF L.10.

D. G. BRAIDWOOD, Parduvine, Lasswade, Mid-Lothian, Dalkeith } School,	1876
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VETERINARY DEPARTMENT.

In the year 1823 the Highland and Agricultural Society instituted lectures in Veterinary Science and Medicine, and arranged with the late Professor Dick to conduct the same.

In 1824 Examinations were commenced and Certificates granted, but only to Students who attended these lectures. Up to the present time 1102 certificates have been issued.

The Examinations are open to the Students of any Veterinary Teacher duly recognised by Government.

In 1872 it was resolved to adopt the following regulations:—

1. That there be two Examinations yearly, viz.—the First or Preliminary held in July, and the Second or Final in April.

2. Candidates before entering their names for the First or Preliminary Examinations in July, which embrace Botany, Chemistry, and Anatomy, must have attended a Winter and a Summer Session at a Veterinary College recognised by Government, these Sessions being those immediately preceding

the examinations, and they must produce certificates from the Professor of each subject.

3. Candidates before entering their names for the Final Examinations in April, which embrace Practical and Clinique, Histology and Physiology, Materia Medica, Cattle Pathology and Horse Pathology, must have attended a Winter Session at a Veterinary College recognised by Government, after passing the First Examination, that Session being the one immediately preceding this examination, and they must produce certificates from the Professor of each subject.

4. Candidates must pass the Practical and Clinical Examination before they can be examined on the other subjects enumerated in No. 3.

5. Candidates failing to pass the Preliminary Examinations in July may present themselves for examination in April previous to going up for the Practical and Clinique.

6. Candidates failing to pass the Final Examination in April, before being allowed to present themselves for Re-examination, are required to attend a Veterinary College during one Session, which must be the one immediately preceding.

7. Members of the Medical Profession, or of any Colonial or Foreign Veterinary School or College, are allowed to present themselves for Examination after attending one Winter Session at a Veterinary College in this country, and receive the Certificate on passing the Final or Major Examination only.

NEW REGULATION.

In 1877 it was resolved that all students who commence their Veterinary Curriculum after 1st January of that year, will be required to attend three Winter and two Summer Sessions before presenting themselves for final examination.

In 1874 the Society resolved to vote Eight Silver Medals (viz., three in July and five in April) to each of the two Veterinary Colleges in Edinburgh, and to the one in Glasgow, for Class Competition; and two Medium Gold Medals, open to all the Students who come up to the April Examination for the Society's Veterinary Certificate for best general and best practical Clinique Examinations.

The examinations are conducted by leading members of the Medical Faculty and of the Veterinary Profession; and a Certificate in the following terms, bearing the corporate seal and arms of the Society, and signed by the Examiners, is granted to those Students who pass the Final Examinations:—

HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

Veterinary Examination.

At Edinburgh, the day of 18

These are to certify that has attended
as a student during the period prescribed by the regulations established by the Directors of the Society, and, having been examined by us, we consider him duly qualified to practise the Veterinary Art.

Graduates of the Society are eligible for appointment as Veterinary Surgeons in Her Majesty's service, &c.

BOARD OF EXAMINERS—JULY 1876.

1. *Botany*.—Professor Balfour; Dr Cleghorn, Stravithy, St Andrews.
2. *Chemistry*.—Dr W. Craig; A. Inglis M'Callum.
3. *Anatomy*.—Dr Dycer; C. Cunningham, Slateford; Andrew Spreull, Dundee.

BOARD OF EXAMINERS—APRIL 1876.

1. *Practical and Clinical Examinations*.—Thomas A. Dollar, London; Finlay Dun, Weston Park, Shipston-on-Stour; Tom Taylor, Manchester; John Lawson, Manchester; John Steele, Biggar; John Borthwick, Kirkliston; C. Cunningham, Slateford.
2. *Physiology and Histology*.—Dr Dycer; C. Cunningham, Slateford; Andrew Spreull, Dundee.
3. *Materia Medica*.—Professor Balfour; Professor Douglas MacLagan; Finlay Dun, Weston Park; Dr Craig; A. I. McCallum.
4. *Diseases of Horses*.—John Borthwick, Kirkliston; John Lawson, Manchester; Wm. Connochie, Selkirk; Tom Taylor, Manchester.
5. *Diseases of Cattle, Sheep, Swine, and Dogs*.—Thomas A. Dollar, London; John Steele, Biggar; Alexander Pottie, Paisley.

President of the Board—Dr Dycer, Edinburgh.

President of the Clinical Board—Thomas A. Dollar, London.

SYLLABUS OF VETERINARY EXAMINATIONS.

FIRST EXAMINATIONS HELD ANNUALLY IN JULY.

BOTANY.

Structure and functions of nutritive and reproductive organs of plants. Natural families of medicinal and poisonous Plants. Diseases of agricultural plants caused by fungi. *Text-book*—Balfour's "Elements of Botany;" A. & C. Black; 3s. 6d.

CHEMISTRY.

Elements of inorganic and organic chemistry; physiological chemistry testing for commoner metals. *Text-book*—Roscoe's "Lessons in Elementary Chemistry;" Macmillan & Co.; 4s. 6d.

ANATOMY.

Anatomy of bones, muscles, blood-vessels, nerves, and viscera of horse, cow, and dog. Description of relative position of parts displayed by various dissections. Demonstration from actual specimens of muscles, tendons, blood-vessels, and nerves, of horse's limbs, larynx, eye, &c. Comparative anatomy of veterinary patients. The breeding, rearing, feeding, and humane treatment of the live stock of the farm—the different breeds—their characteristics—the districts where they are principally met with—and also the best and most humane system of horse-breaking. *Text-books*—Strangeways' "Anatomy," Maclellan & Stewart, 17s. Chauveau's "Comparative Anatomy of the Domesticated Animals," by George Fleming, Veterinary Surgeon, Royal Engineers, Churchill & Sons; L1, 11s. 6d.

SECOND EXAMINATIONS HELD ANNUALLY IN APRIL.

THE PRACTICAL AND CLINICAL EXAMINATION

Include diagnosis and treatment, orally and in writing, of cases of lameness and diseases of horses, cattle, sheep, dogs, and swine. Examination of horses as to soundness. Surgical and other operations performed on veterinary patients. Examination, chiefly of morbid specimens, mostly conducted at the abattoirs.

PHYSIOLOGY AND HISTOLOGY.

Minute anatomy of bone, blood, lung, and other tissues, of inflammatory products, and of tumours. Processes of digestion, circulation, respiration, secretion, and excretion. Functions of nervous and reproductive systems. *Text-books*—"Lessons in Elementary Physiology," by Thomas H. Huxley, LL.D. and F.R.S., Macmillan & Co., 4s. 6d. Kirkes' "Physiology." Bennet's "Physiology."

MATERIA MEDICA.

Preparation, properties, actions, uses, and doses of medicines. Poisoning in the lower animals, symptoms, post-mortem appearances, antidotes. Writing of prescriptions. *Text-books*—"Veterinary Medicines, their Actions and Uses," by Finlay Dun, Edmonston & Douglas, Edinburgh, 12s. 6d. "Veterinarian's Pocket Conspectus," by Thomas Walley, M.R.C.V.S., Lorimer and Gillies, Edinburgh.

DISEASES OF HORSES.

Nature, symptoms, post-mortem appearances, causes, treatment, and prevention; accidents; construction and management of stables; shoeing. *Text-books*—"Manual of Veterinary Science," by the late William Dick, A. & C. Black. Green's "Morbid Anatomy." Williams' "Principles and Practice of Veterinary Surgery," Maclachlan & Stewart, Edinburgh, 30s.

DISEASES OF CATTLE, SHEEP, SWINE, AND DOGS.

Nature, symptoms, post-mortem appearances; remedial and preventive treatment; dieting and general management of domestic animals. *Text-books*—Youatt on "Cattle, Sheep, Pigs, and Dogs." Blaine's "Principles of Veterinary Art." Gamgee's "Domesticated Animals in Health and Disease," Fullarton & Co., Edinburgh. Williams' "Principles and Practice of Veterinary Medicine," 30s.

CERTIFICATES IN FORESTRY.

The Society grants FIRST and SECOND CLASS CERTIFICATES in FORESTRY.

BOARD OF EXAMINERS.

1. *Science of Forestry and Practical Management of Woods*.—Dr CLEGHORN, Stravithy, St Andrews; JOHN MACGREGOR, Ladywell, Dunkeld; WILLIAM M'CORQUODALE, Scone Palace, Perth; J. GRANT THOMSON, Grantown, Strathspey.
2. *Elements of Botany*.—Professor BALFOUR.
3. *Nature and Properties of Soils, Drainage, and Effects of Climate*.—Professor WILSON.
4. *Land and Timber Measuring and Surveying; Mechanics and Construction, as applied to Fencing, Drainage, Bridging, and Road-Making; Implements of Forestry*.—A. W. BELFRAGE, C.E.
5. *Book-keeping and Accounts*.—KENNETH MACKENZIE, C.A.

Candidates must possess—1st, A thorough acquaintance with the details of practical forestry. 2d, a general knowledge of the following branches of study, so far as these apply to Forestry:—The Outlines of Botany; the Nature and Properties of Soils, Drainage and Effects of Climate; Land and Timber Measuring and Surveying; Mechanics and Construction, as applied to fencing, draining, bridging, and road-making; Implements of Forestry; Book-keeping and Accounts. The Examinations are open to Candidates of any age.

SYLLABUS OF EXAMINATION.

I.—SCIENCE OF FORESTRY AND PRACTICAL MANAGEMENT OF WOODS.

1. Formation and ripening of Wood. Predisposing causes of decay. 2. Restoration of Wood-lands :—(1.) Natural reproduction ; (2.) Artificial planting. 3. General management of plantations. Cropping by rotation. Trees recommended for different situations. 4. Season and methods of pruning, thinning and felling. 5. Circumstances unfavourable to the growth of trees. 6. Mechanical appliances for conveying and converting timber. Construction of saw-mills. 7. Qualities and uses of chief indigenous timbers. Processes of preserving timber. 8. Management of nurseries. Seed-sowing. 9. Collection of forest produce. 10. Manufacture of tar and charcoal. 11. Insects injurious to trees—preservation of birds which prey upon them, drawing a distinction between birds which are beneficial and those which are destructive to trees.

II.—ELEMENTS OF BOTANY.

1. Nutritive Organs of plants.—Root, stem, leaves. Functions of roots. Various kinds of stems, with examples. Use of the stem. Structure of leaves. Different kinds of leaves. Arrangement and functions of leaves. 2. Reproductive Organs.—Flower and its parts. Arrangement of the whorls of the flower—calyx, corolla, stamens, pistil. Ovule. Mature pistil or fruit. Pruning and grafting. Seed. Young plant or embryo. Sprouting of the seed or germination. 3. General Principles of Classification.—Meaning of the terms Class, Order, Genus, Species. Illustrations taken from common forest trees and shrubs. Practical Examination on fresh specimens and models : some of the latter may be seen in the Museum at the Royal Botanic Garden, which is open daily to the public free. Candidates may consult Professor Balfour's "Elements of Botany," published by A. & C. Black, Edinburgh 1869. Price 3s. 6d.

III.—NATURE AND PROPERTIES OF SOILS, DRAINAGE AND EFFECTS OF CLIMATE.

1. The different descriptions of soils, their classification, and suitability to growth of different descriptions of timber trees. 2. The composition and constituents of soils. The relations between the soil and trees growing on it. 3. The effects of drainage on soils and on climate. 4. The mode of drainage for plantations. 5. The influence of temperature, rainfall, aspect, shelter, and prevailing winds on tree life. 6. The methods of registering and recording observations, and the instruments used.

IV.—LAND AND TIMBER MEASURING AND SURVEYING ; MECHANICS AND CONSTRUCTION AS APPLIED TO FENCING, BRIDGING, AND ROAD-MAKING ; IMPLEMENTS OF FORESTRY.

1. The use of the Level and Measuring Chain. Measuring and mapping surface area. 2. The measurement of solid bodies—as timber, stacked bark, faggots, &c., earthwork. 3. The different modes of fencing and enclosing plantations ; their relative advantages, durability, cost of construction, and repairs. 4. The setting out and formation of roads for temporary or permanent use. 5. The construction of bridges over streams and gullies ; of gates

or other entrances. 6. The different implements and tools used in planting, pruning, felling, barking, and working up timber trees, or preparing them for sale. Ewart's "Agricultural Assistant," Blackie & Son, Glasgow and Edinburgh, price 3s. 6d. Strachan's "Agricultural Tables," Oliver & Boyd, Edinburgh, price 2s. 6d.

V.—BOOK-KEEPING AND ACCOUNTS.

1. Questions in practice and proportion. 2. Book-keeping—describe books to be kept; give examples. Taking of stock.

The following have passed for First-Class Certificate:—

1. <i>C. F. Bligh, England,*</i>	1870
2. GEORGE YOUNG WALL, M.R.A.C., Durham,	1870
3. WILLIAM BAILLIE, Forester, Whitingham, East Lothian,	1871
4. WILLIAM ROBERTSON, Forester's House, Lauder,	1871
5. PETER LONEY, Marchmont, Dunse,	1873

* Names of those deceased, so far as known, are printed in italics.

CHEMICAL DEPARTMENT.

The object of the Chemical Department is to arrange Experiments to be conducted at the Society's Agricultural Stations, in terms of the Report of the General Meeting, 17th January 1877. See Appendix A, p. 19.

Chemist.—Dr ANDREW P. AITKEN.—Highland and Agricultural Society's Chambers, No. 3 George IV. Bridge, Edinburgh, who will be in attendance there on Wednesdays from 12 to 2, and daily at the Laboratory, Veterinary College, Clyde Street, where samples for analysis should be sent.

P R E M I U M S

GENERAL REGULATIONS FOR COMPETITORS.

All Reports must be legibly written, and on one side of the paper only; they must specify the number and subject of the Premium for which they are in competition; they must bear a distinguishing motto, and be accompanied by a sealed letter similarly marked, containing the name and address of the Reporter—initials must not be used.

No sealed letter, unless belonging to a Report found entitled to at least one-half of the Premium offered, will be opened without the author's consent.

Reports, for which a Premium, or one-half of it, has been awarded, become the property of the Society, and cannot be published in whole or in part, nor circulated in any manner, without the consent of the Directors. All other papers will be returned to the authors, if applied for within twelve months.

When a Report is unsatisfactory, the Society is not bound to award the whole or any part of a premium.

All Reports must be of a practical character, containing the results of the writer's own observation or experiment, and the special conditions attached to each Premium must be strictly fulfilled. General essays, and papers compiled from books, will not be rewarded. Weights and measurements must be indicated by the imperial standards.

The Directors, before awarding a Premium, shall have power to require the writer of any Report to verify the statements made in it.

The decisions of the Board of Directors are final and conclusive as to all Premiums, whether for Reports or at General or District Shows; and it shall not be competent to raise any question or appeal touching such decisions before any other tribunal.

Reports on subjects not included in the Premium List will be received, and honorary regards will be given when merited.

CLASS I.

R E P O R T S

SECTION 1.—THE SCIENCE AND PRACTICE OF AGRICULTURE.

FOR APPROVED REPORTS.

1. On the Agriculture of the County of Argyll—Thirty Sovereigns. To be lodged by 1st November 1877.

The Report should embrace full details of the different systems of Farm Management observed in the County, and of the progress which Agriculture and other industries have made within the last 25 years.

2. On the Agriculture of the Counties of Forfar and Kincardine—Thirty Sovereigns. To be lodged by 1st November 1877.

The Report should embrace full details of the different systems of Farm Management observed in the Counties, and of the progress which Agriculture and other industries have made within the last 25 years.

3. On the Agriculture of Bute and Arran—Twenty Sovereigns. To be lodged by 1st November 1878.

The Report should embrace full details of the different systems of Farm Management observed in the County, and of the progress which Agriculture and other industries have made within the last 25 years.

4. On the Physiological Distinctions in the condition of the Scottish Peasantry in different Districts—Thirty Sovereigns. To be lodged by 1st November 1877.

The reporter must furnish statistics of the longevity, &c., of the peasantry, as contrasted with other classes, and give suggestions for the amelioration of any causes which affect them injuriously.

5. On the results of Experiments for fixing and retaining the volatile and soluble ingredients in farm-yard Manure—Twenty Sovereigns. To be lodged by 1st November 1880.

The Report must detail the treatment adopted to fix and retain these ingredients—the materials used for that purpose—and the quantity and cost thereof—comparative analyses of the manure with and without the treatment, and also a statement of the crops grown with

manure with and without such treatment, must be given by the Reporter. The experiments to have extended over at least two years and crops.

6. On the comparative advantages in Scotland of Ploughing in Manure in Autumn or Winter immediately after it is spread on the land, or of allowing it to remain on the ground for some weeks before it is covered—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1877.

7. On the results of Experiments for ascertaining the comparative value of farm-yard Manure obtained from cattle fed upon different varieties of food, by the application of such manures to farm crops—Twenty Sovereigns. To be lodged by 1st November in any year.

The Report must state the effects produced on two successive crops by the application of manure obtained from cattle fed on different sorts of food, such as turnips and straw alone; and turnips and straw, with an addition of oil-cake, linseed, bean-meal, grain, or other substances. The animals should be as nearly as possible of the same age, weight, condition, and maturity, and each lot should receive daily the same quantity of litter; and, except as to the difference of food, they must be treated alike.

The preparation of the manure, by fermentation or otherwise, should be in every respect the same; and it is desirable that not less than two several experiments be made with each kind, and that the ground to which it is to be applied be as equal as possible in quality and condition.

8. On the comparative value of Manure made in the ordinary manner, and of Manure kept under cover till applied to the Land—Twenty Sovereigns. To be lodged by 1st November in any year.

The experiment may be conducted either with manure made in the open straw-yard, contrasted with that made in covered haumels or boxes, or with manure made in feeding houses, part of which shall have been placed under cover, and part removed to the open dung-pit, and kept carefully unmixed with any other manure. Preference will be given to experiments embracing both of these modes. The cattle must be fed and littered alike. There must be at least an acre of land experimented on with each sort of manure—the different lots must be manured to the same extent, and be equal in soil, and the crops must be accurately weighed and measured on two separate portions of each lot, not less than 20 poles. The result, as given by two successive crops, to be reported.

9. On the means successfully employed for obtaining new Agricultural Plants, or new and superior varieties, or improved sub-varieties, of any of the cereal grains, grasses, roots, or other agricultural plants at present cultivated in this country—Medals

or Sums of Money not exceeding Fifty Sovereigns. To be lodged by 1st November in any year.

It is necessary that the varieties and sub-varieties reported upon shall have been proved capable of reproduction from seed, and also that the relation they bear to others, or well known sorts, should be stated. The reporter is further requested to mention the effects that he may have observed produced by different soils, manures, &c., on the plants forming the subjects of report, and how far he may have ascertained such effects to be lasting.

Should any improved variety reported upon be the result of direct experiment by cross impregnation, involving expense and long-continued attention, a higher premium will be awarded.

10. On the cultivation of the Cabbage as a field crop—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1877.

The experiment must be conducted in Scotland on not less than one acre, and contrasted with a like extent under turnips in the same field. Both lots must have been under one rotation, and must be prepared and manured in the same manner.

11. On the Insects which prey upon agricultural plants, and the diseases occasioned by them, and the best means of prevention—Twenty Sovereigns. To be lodged by 1st November 1877.

The Report to be accompanied, where practicable, by specimens of the insects.

12. On the hardy and useful Herbaceous Plants of any country where such climate exists as to induce the belief that the plants may be beneficially introduced into the cultivation of Scotland—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

Attention is particularly directed to the Grains and Grasses of China, Japan, the Islands of the Eastern Archipelago, the Himalaya country, the Falkland and South Sea Islands, California, and the high north-western district of America.

Reporters are required to give the generic and specific names of the plants treated of, with the authority for the same—together with the native names, so far as known; and to state the elevation of the locality and nature of the soil in which they are cultivated, or which they naturally inhabit, with their qualities or uses; and it is further requested that the descriptions be accompanied, in so far as possible, with specimens of the plants, and their fruit, seed, and other products.

13. On the adulteration of Agricultural Seeds, whether by colouring, mixing, or otherwise, and the best means of detecting the same, and preventing their sale—Ten Sovereigns. To be lodged by 1st November 1877.

14. On the comparative advantages of fattening Cattle in stalls, in loose houses or boxes, and in sheds or hammels—

Twenty Sovereigns. To be lodged by 1st November in any year.

The Report must detail the comparative result of actual experiments.

The same quantities and kinds of food must be used. Information is required as to the comparative expense of attendance, the cost of erecting the buildings, and any other circumstance deserving of attention. The state of the weather during the experiment, in point of temperature and wetness, must be particularly noted and reported.*

15. On experiments for ascertaining the actual addition of weight to growing or fattening Stock, by the use of different kinds of food—Twenty Sovereigns. To be lodged by 1st November in any year.

The attention of the experimenter is directed to turnips, carrots, beet, mangold wurzel, potatoes, cabbage, as well as to beans, oats, barley, Indian corn, linseed, oil-cake or rape-cake, and to the effect of warmth and proper ventilation, and the difference between food cooked and raw. The above roots and other kinds of food are merely suggested; competitors are neither restricted to them nor obliged to experiment on all of them.

When experiments are made with linseed and cake, attention should be paid to the comparative advantages, economically and otherwise, of the substance in these two states.

Before commencing the comparative experiments, the animals must be fed alike for some time previously.

The progress of different breeds may be compared. This will form an interesting experiment of itself, for reports of which encouragement will be given.*

* The experiments specified in Nos. 14 and 15 must be conducted over a period of not less than three months. No lot shall consist of fewer than four Cattle or ten Sheep. The animals selected should be of the same age, sex, and breed, and, as nearly as possible, of the same weight, condition, and maturity. The live weight before and after the experiment must be stated, and, if killed, their dead weight and quantity of tallow.

16. On the Galloway Breed of Cattle, and the means that have been or might be used for its improvement—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1877.

17. On the breeding of Horses for the road or field, and their treatment when young—Ten Sovereigns. To be lodged by 1st November 1877.

This Report is confined to breeders of horses, who are requested to state their own experiments and results.

18. On the adaptability of the various soils to the breeding and rearing of Horses—Ten Sovereigns. To be lodged by 1st November 1877.

The Report must state the diseases arising from pasturing on the various soils, and how to prevent them.

19. On the effect of Sewage upon the Animal System, introduced either with drinking water or with herbage when it has been used as a top-dressing—Ten Sovereigns. To be lodged by 1st November 1877.

20. On Hoose or Husk in Calves and Lambs—Ten Sovereigns. To be lodged by 1st November 1877.

The Report must contain special reference to the nature of the soil on which the disease prevails, and suggest methods calculated to remove the cause of the disease.

21. On Strangles—Ten Sovereigns. To be lodged by 1st November 1877.

The Report must state the causes, symptoms, and treatment, and special reference must be made as to whether it is a contagious disease.

22. On the comparative Return from Capital invested in Cropping, Grazing, or Planting land upon hill and moorland—Twenty Sovereigns. To be lodged by 1st November 1877.

The subject to have reference not only to immediate return upon capital expended, but also to be considered in relation to the amelioration of the soil, climate, and prospective enhancement of value thereby.

23. On the best means of erecting Farm Steadings and other buildings with the view of making them rat-proof—Five Sovereigns. To be lodged by 1st November 1877.

The construction of the drains to be specially noticed.

24. On any useful practice in Rural Economy adopted in other countries, and susceptible of being introduced with advantage into Scotland—The Gold Medal. To be lodged by 1st November in any year.

The purpose chiefly contemplated by the offer of this premium is to induce travellers to notice and record such particular practices as may seem calculated to benefit Scotland. The Report to be founded on personal observation.

SECTION 2.—ESTATE IMPROVEMENTS.

FOR APPROVED REPORTS.

1. By the Proprietor in Scotland who shall have executed the most judicious, successful, and extensive improvement—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

Should the successful Report be written for the Proprietor by his resident factor or farm manager, a Medium Gold Medal will be awarded to the writer in addition to the Gold Medal to the Proprietor.

The merits of the Report will not be determined so much by the mere extent of the improvements as by their character and relation to the size of the property. The improvements may comprise reclaiming, draining, enclosing, planting, road-making, building, and all other operations proper to landed estates. The period within which the operations may have been conducted is not limited, except that it must not exceed the term of the reporter's proprietorship.

2. By the Proprietor in Scotland who shall have erected on his estate the most approved Farm-buildings—The Gold Medal. Reports, Plans, and Specifications to be lodged by 1st November in any year.

3. By the Proprietor or Tenant in Scotland who shall have reclaimed within the ten preceding years not less than forty acres of waste land—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

4. By the Tenant in Scotland who shall have reclaimed within the ten preceding years not less than twenty acres of waste land—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

5. By the Tenant in Scotland who shall have reclaimed not less than ten acres within a similar period—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November in any year.

The Reports in competition for Nos. 3, 4, and 5 may comprehend such general observations on the improvement of waste lands as the writer's experience may lead him to make, but must refer especially to the lands reclaimed—to the nature of the soil—the previous state and probable value of the subject—the obstacles opposed to its improvement—the details of the various operations—the mode of cultivation adopted—and the produce and value of the crops produced. As the required extent cannot be made up of different patches of land, the improvement must have relation to one subject; it must be of a profitable character, and a rotation of crops must have been concluded before the date of the report. *A detailed statement of the expenditure and returns*, and a certified measurement of the ground, are requisite.

6. By the Proprietor or Tenant in Scotland who shall have improved within the ten preceding years the pasturage of not less than thirty acres, by means of top-dressing, draining, or otherwise, without tillage, in situations where tillage may be inexpedient—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

7. By the Tenant in Scotland who shall have improved not less than ten acres within a similar period—The Minor Gold Medal. To be lodged by 1st November in any year.

Reports in competition for Nos. 6 and 7 must state the particular mode of management adopted, the substances applied, the elevation and nature of the soil, its previous natural products, and the changes produced.

SECTION 3.—MACHINERY.

FOR APPROVED REPORTS.

1. On such inventions or improvements, by the reporters, of any implement or machine as shall be deemed by the Society of public utility—Medals, or sums of money not exceeding Fifty Sovereigns. To be lodged at any time.

Reports should be accompanied by drawings and descriptions of the implement or machine, and, if necessary, by a model.

2. On a Machine for cutting or condensing Turf or Peat by steam or horse power—Twenty Sovereigns. To be lodged by 1st November 1877.

3. On the best means of Drying Compressed Peat-fuel, so that its manufacture on a large scale could be carried on throughout the whole year—Ten Sovereigns. Reports to be lodged by 1st November 1877.

4. On the best and most approved Cattle Truck for feeding and watering the animals in transit—Twenty Sovereigns. To be lodged by 1st November 1877.

Reports must be accompanied with drawings and description, or, if necessary, by a model.

SECTION 4.—FORESTRY DEPARTMENT.

FOR APPROVED REPORTS.

1. By the Proprietor in Scotland who shall, within the five preceding years, have planted not less than 150 acres—The Gold Medal. To be lodged by 1st November in any year.

The whole planting operations which may have been conducted by the reporter within the five years, whether completed or not, must be embraced, and he must state the expense—description of soils,—age, kind, and number of trees planted per acre—mode of planting, draining, and fencing—general state of the plantation—and any other observations of interest.

2. On Plantations of not less than eight years' standing, formed on deep peat bog—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1877.

The Premium is strictly applicable to deep peat or flow moss; the condition of the moss previous to planting, as well as at the date of the Report, should, if possible, be stated.

The Report must describe the mode and extent of the drainage, and the effect it has had in subsiding the moss—the trenching, levelling, or other preliminary operations that may have been performed on the surface—the mode of planting—kinds, sizes, and numbers of trees planted per acre—and their relative progress and value, as compared with plantations of a similar age and description grown on other soils in the vicinity.

3. On the more extended introduction of hardy, useful, or ornamental Trees, which have not hitherto been generally cultivated in Scotland—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November in any year.

The Report should specify as distinctly as possible the kind of trees introduced. The adaptation of the trees for use or ornament, and their comparative progress should be mentioned. Attention is directed to the introduction of any tree as a nurse in young plantations, which by growing rapidly for several years, and attaining maturity when at the height of 20 or 25 feet, might realise the advantage and avoid the evils of thick planting.

4. On the *Abies Menziesii*, and its value for planting in Scotland, with detailed statistics of its progress in the country.—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1877.

5. On the varieties of Trees best adapted for planting as shelter in the Islands of Scotland—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1877.

6. On the growth and cultivation of Willows in Scotland with a view to profit.—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1877.

The different varieties recommended to be specially described.

7. On the Cutting and Transport of Firewood (soft and hard wood), with detailed statement of charges—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1877.

In many districts large branches and tops of trees are burned up, which in England, and much more on the Continent, are sold at a profit. The Report should state the system pursued, and contain practical suggestions for utilising fragments now destroyed.

8. On the more extended cultivation in Scotland of charcoal-producing Plants, for gunpowder or commercial purposes—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1877.

Reference to be made to suitable varieties of plants not generally grown in this country for that purpose, such as *Rhamnus Frangula*, prices realisable, and suggestions for their more general introduction, treatment, &c.

9. On the Woods, Forests, and Forestry in the county of Perth—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1877.

10. On the Woods, Forests, and Forestry in the county of Ross—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1877.

11. On the Woods, Forests, and Forestry in the county of Inverness—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1877.

12. On the utilisation of waste produce of Forests and Woodlands, as matter for making, either separately or in combination with other substances, an Artificial Fuel—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1877.

13. On the Insects most injurious to Forest Trees, and the diseases occasioned by them, and the best means of prevention.—Twenty Sovereigns. To be lodged by 1st November 1877.

The Report to be accompanied, where practicable, by specimens of the insects.

CLASS II.

DISTRICT COMPETITIONS.

The Money Premiums and Medals awarded at District Competitions will be issued in January next. No payments must, therefore, be made by the Secretary or Treasurer of any local Association.

Grants in Aid of DISTRICT COMPETITIONS for 1878 must be applied for before 1st NOVEMBER next.

When a Grant has expired, the District cannot apply again for aid for two years.

SECTION 1.—CATTLE.

Note.—The Society's Cattle Premiums are granted to each District for three alternate years, on condition that the District shall, in the two intermediate years, continue the Competitions by offering for the same description of stock a sum not less than one-half of that given by the Society.

At the intermediate Competitions, a Silver Medal will be placed at the disposal of the Committee, to be awarded for the best Bull belonging to a Proprietor, and of the class for which the District receives Premiums; also three Medium Silver Medals to be given along with the first prize in the three Classes of Cattle belonging to Tenants, provided there are not fewer than two lots exhibited in each class.

The selection of the Breed is left to the local Committee. See Rule 6.

DISTRICTS.

1. COUNTY OF ELGIN.—*Couroner*, Robert Grant of Kincoth, Forres; *Joint-Secretaries*, William Macdonald, Elgin, and John Ferguson, East Grange, Forres. Granted 1872.
2. COUNTY OF RENFREW.—*Couroner*, Colonel Campbell of Blythswood; *Secretary*. Granted 1872.
3. DISTRICT OF EAST KILBRIDE.—*Couroner*, William Forrest of Lawmuir, Albion, Hamilton; *Secretary*, William Hay, Auburn Cottage, East Kilbride. Granted 1874.
4. COUNTY OF KINCARDINE.—*Couroner*, Sir Thomas Gladstone of Fasque, Port., Laurencekirk; *Secretary*, James B. Greig, Laurencekirk. Granted 1874.
5. DISTRICT OF GARIOCH.—*Couroner*, William Leslie of Warthill, Piteaple; *Secretary*, William Home, Westerton of Pitmedden, Insh. Granted 1874.
6. DISTRICT OF STRATHBOGIE.—*Couroner*, Robert Simpson of Cobairdy, Huntly; *Secretary*, Alexander F. Leslie, Corskellie, Huntly. Granted 1875.

7. DISTRICT OF THE UNITED BANFFSHIRE SOCIETY.—*Convener*, W. J. Tayler of Glenbarry, Rothiemay House, Huntly; *Secretary*, George Cumming, Banff. Granted 1875.
8. DISTRICT OF TURRIFF.—*Convener*, Alexander Stuart of Laithers, Turriff; *Secretary*, William Ingram, Sunnyhill, Turriff. Granted 1877.
9. DISTRICT OF AVONDALE.—*Convener*, Thomas Tennent of Priestgill, Strathaven; *Secretary*, William Lambie of Hallburn, Strathaven. Granted 1877.
10. DISTRICT OF WEEM.—*Convener*, Sir Robert Menzies, of Menzies, Bart., Farleyer, Aberfeldy; *Secretary*, P. M. Conacher, Gallin Cottage, Aberfeldy. Granted 1877.
11. DISTRICT OF UPPER STRATHEARN.—*Convener*, D. R. Williamson of Lawers, Crieff; *Secretary*, James M'Laren, junior, Crieff. Granted 1876.

PREMIUMS.

1. Best Bull, of any pure breed, belonging to a Proprietor, The Silver Medal.
2. Best Bull, of any pure breed, calved before 1st January 1875.

	Medium Silver Medal and L.4
Second best,	L.3
Third best,	L.1
3. Best Bull of any pure breed, calved after 1st January 1875,

	Medium Silver Medal and L.3
Second best,	L.2
Third best,	L.1
4. Best 2-year-old Heifer (if Highland breed, 3 years), of any pure breed.

	Medium Silver Medal and L.3
Second best,	L.2
Third best,	L.1

In 1877.

Nos. 1 and 2 are in competition for the last year.

Nos. 3, 4, 5, 6, and 7 for the second year.

Nos. 8, 9, and 10 for the first year.

No. 11 competes for local Premiums.

SECTION 2.—HORSES

FOR AGRICULTURAL PURPOSES.

Note.—The Society's Stallion Premiums are granted to each District for two years, and are followed by Premiums for other two years for Brood Mares, and again for a similar period by Premiums for Entire Colts and Fillies.

1. STALLIONS.

1. DISTRICT OF THE DALBEATTIE SOCIETY.—*Convener*, W. H. Maxwell of Munches, Dalbeattie; *Secretary*, W. Dickie, Balgerran, Castle Douglas. Granted 1876.
2. RHINS DISTRICT OF WIGTOWNSHIRE.—*Convener*, R. Vans Agnew of Barnbarroch, M.P.; *Secretary*, Hugh Adair, Stranraer. Granted 1876.
3. DISTRICT OF AUCHTERMUCHTY.—*Convener*, John Bogie, Balcanquhal, Auchtermuchty; *Secretary*, H. W. Walker, Auchtermuchty. Granted 1876.
4. DISTRICT OF THE EAST OF FIFE SOCIETY.—*Convener*, John Anstruther Thomson of Charlton, Colinsburgh; *Secretary*, John Flockhart, Colinsburgh. Granted 1876.

5. COUNTY OF CLACKMANNAN.—*Convener*, James Johnstone of Alva ; *Secretary*, Thomas Fisher, Jellyholm, Alloa. Granted 1877.
6. DISTRICT OF LOCKERBIE.—*Convener*, Sir Alexander Jardine of Applegarth, Bart., Jardine Hall, Lockerbie ; *Secretary*, George Bell Ewart, Lockerbie. Granted 1877.

Best Stallion, not under 3 years, and not above 12 years old, . . . L.25

In 1877.

Nos. 1, 2, 3, and 4 are in competition for the last year.

Nos. 5 and 6 for the first year.

2. BROOD MARES.

1. WESTERN DISTRICT OF FIFESHIRE.—*Convener*, Robert Husband, Gellat, Dunfermline ; *Secretary*, James McFarlane, Dunfermline. Granted 1876.
2. DISTRICT OF STRATHENDRICK.—*Convener*, C. H. H. Wilson of Dalnair, Endrick Bank, Drymen ; *Secretary*, James Murray, Catter House, Drymen. Granted 1876.
3. DISTRICT OF EASTER ROSS.—*Convener*, David Monro of Allan, Tain ; *Secretary*, Hugh Murray, Banker, Tain. Granted 1877.
4. DISTRICT OF THE ROYAL NORTHERN SOCIETY.—*Convener*, Colonel Innes of Learney, Torphins ; *Secretary*, Alexander Yeats, Secretary Royal Northern Society, Aberdeen. Granted 1877.

1. Best Brood Mare, Medium Silver Medal and L.4
2. Second best, L.3
3. Third best, L.1

In 1877.

Nos. 1 and 2 are in competition for the last year.

Nos. 3 and 4 for the first year.

3. ENTIRE COLTS AND FILLIES.

1. DISTRICT OF THE BLACK ISLE.—*Convener*, James Fletcher of Roschannah, Avoch ; *Secretary*, James R. Mitchell, Drynie, Inverness. Granted 1876.
2. COUNTY OF KINROSS.—*Convener*, Harry Young of Cleish Castle, Kinross ; *Secretary*, James Beveridge of Balado, Kinross. Granted 1876.
3. DISTRICT OF BUCHAN.—*Convener*, Lieutenant-Colonel Ferguson of Pitfour, Mintlaw ; *Secretary*, John Ferguson, Brae of Coynach, Mintlaw. Granted 1877.
4. DISTRICT OF SELKIRK AND GALASHIELS.—*Convener*, Allan Elliott Lockhart of Borthwickbrae, Hawick ; *Secretary*, James Smail, Commercial Bank, Galashiels. Granted 1877.
5. COUNTY OF CAITHNESS.—*Convener*, Alexander Henderson of Stemster, Halkirk Road, Golspie ; *Joint-Secretaries*, James Brims, Writer, Thurso ; and James Purves, Lochend, Dunnet. Granted 1877.

1. Best Entire Colt, foaled after 1st January 1875, Medium Silver Medal and L.3
 Second best, L.2
 Third best, L.1
2. Best Entire Colt, foaled after 1st January 1876, Medium Silver Medal and L.2
 Second best, L.1
 Third best, 10s.

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| 3. Best Filly, foaled after 1st January 1875, Medium Silver Medal and | L.3 |
| Second best, | L.2 |
| Third best, | L.1 |
| 4. Best Filly, foaled after 1st January 1876, Medium Silver Medal and | L.2 |
| Second best, | L.1 |
| Third best, | 10s. |

In 1877.

Nos. 1 and 2 are in competition for the last year.
Nos. 3, 4, and 5 for the first year.

SECTION 3.—SHEEP.

Note.—The Society's Sheep Premiums are granted to each District for three alternate years, on condition that the District shall, in the two intermediate years, continue the Competitions by offering for the same description of stock a sum not less than one-half of that given by the Society.

At the intermediate Competitions, a Silver Medal will be placed at the disposal of the Committee, to be awarded for the best Tup belonging to a proprietor, and of the class for which the District receives Premiums; also four Medium Silver Medals, to be given along with the first prize in the four classes of Sheep, belonging to tenants, provided there are not less than two lots in each class.

The selection of the breed is left to the Local Committee. See Rule 6.

DISTRICTS.

1. UPPER WARD OF LANARKSHIRE.—*Convener*, John Ord Mackenzie of Dolphinton; *Secretary*, David Oswald, Abington. Granted 1872.
2. ISLANDS OF MULL, COLL, AND TYREE.—*Convener*, Farquhar Campbell of Rum; *Secretary*, David Thorburn, Calgary, Tobermory. Granted 1872.
3. DISTRICT OF THE BADENOCH AND ROTHMURCHUS SOCIETY.—*Convener*, Cluny Macpherson, Cluny Castle, Kingussie; *Secretary*, Donald Stewart, Chapelark, Kingussie. Granted 1875.
4. COUNTY OF SUTHERLAND.—*Convener*, George Loch of Embo, Q.C.; *Secretary*, William Mitchell, Pulrossie, Dornoch. Granted 1875.
5. DISTRICT OF THE WEST LINTON SOCIETY.—*Convener*, A. P. Hope of Bordlands, Lamancha; *Secretary*, A. Alexander, West Linton. Granted 1875.
6. DISTRICT OF THE NORTHERN PASTORAL CLUB.—*Convener*, Arthur Forbes of Culloeden, Inverness; *Secretary*, Walter Mundell, Gollanfield, Fort George Station. Granted 1877.
7. DISTRICT OF NITHSDALE.—*Convener*, John Gilchrist Clark of Speddoch, Dabton, Thornhill; *Secretary*, Wm. Austin, Thornhill. Granted 1877.
8. DISTRICT OF WEST TEVIOTDALE.—*Convener*, W. Scott Watson of Burnhead, Bucklands, Hawick; *Secretary*, James Oliver of Thornwood, Hawick. Granted 1874.
9. DISTRICT OF BREADALBANE.—*Convener*.—The Earl of Breadalbane, Taymouth Castle, Aberfeldy; *Secretary*, John Holmes, Kenmore, Aberfeldy. Granted 1874.
10. ISLAND OF ARRAN.—*Convener*, James Paterson, Whitehouse, Lamblash; *Secretary*, William Tod, Glenree, Lamblash. Granted 1876.

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| 1. Best Tup belonging to a Proprietor, | | The Silver Medal. |
| 2. Best Tup above one Shear, | | Medium Silver Medal and L.3 |
| Second best, | | L.1 |
| Third best, | | 10s. |
| 3. Best Shearling Tup, | | Medium Silver Medal and L.3 |
| Second best, | | L.1 |
| Third best, | | 10s. |
| 4. Best 5 Ewes above one Shear, | | Medium Silver Medal and L.3 |
| Second best, | | L.1 |
| Third best, | | 10s. |
| 5. Best 5 Gimmers or Shearling Ewes, | | Medium Silver Medal and L.3 |
| Second best, | | L.1 |
| Third best, | | 10s. |

In 1877.

Nos. 1 and 2 are in competition for the last year.

Nos. 3, 4, and 5 for the second year.

Nos. 6 and 7 for the first year.

Nos. 8, 9, and 10 compete for local Premiums.

SECTION 4.—SWINE.

The Society's Swine Premiums are given for three consecutive years.

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| 1. Best Boar belonging to a Proprietor, | | The Silver Medal. |
| 2. Best Boar, | | Medium Silver Medal and L.3 |
| Second best, | | L.1 |
| Third best, | | 10s. |
| 3. Best Brood Sow, | | Medium Silver Medal and L.2 |
| Second best, | | L.1 |
| Third best, | | 10s. |

In 1877.

No application has been received.

SECTION 5.—DAIRY PRODUCE.

The Society's Dairy Premiums are given for three consecutive years.

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| 1. Best Couple of Sweet Milk Cheeses belonging to a Proprietor, | | The Silver Medal. |
| 2. Best Couple of Sweet Milk Cheeses, | | Medium Silver Medal and L.2 |
| Second best, | | L.1 |
| Third best, | | 10s. |
| 3. Best Cured Butter (not less than 14 lbs.), belonging to a Proprietor, | | The Silver Medal. |
| 4. Best Cured Butter (not less than 14 lbs.), | | Medium Silver Medal and L.2 |
| Second best, | | L.1 |
| Third best, | | 10s. |

In 1877.

No application has been received.

RULES OF COMPETITION.

1. The Members of the Highland and Agricultural Society connected with the respective Districts are appointed Committees for arranging the Competitions, the Convener being appointed by the Directors: five members to be quorum.

2. The Convener of each District shall summon a meeting of Committee for the purpose of determining the time and place of Competition, the nomination of Judges, and other preliminary arrangements. The time and place (which must be within the bounds of the District, unless in reference to Stallions special permission has been obtained to the contrary), shall be publicly intimated by Conveners.

3. The Money Premiums awarded at District Competitions will be paid in January next, by precepts issued by the Directors. No payments must, therefore, be paid by the Secretary or Treasurer of any local Association.

4. Stock must be the property of the Exhibitor at the date of Entry. *No entry shall be received later than one week previous to the Show.* Entry-Money shall not exceed $2\frac{1}{2}$ per cent. on the amount of the premium to be competed for.

5. The Competitions (except for Horses) must take place between the 1st of April and the 26th of October, and are open to all parties within the District, whether members of the local Association or not.

6. The Committee shall select the breed, and specify it in the returns. In Cattle, the animals exhibited must belong to one of the following pure breeds—Short-horn, Ayrshire, Polled (Galloway, Angus, or Aberdeen), Highland. The Bulls may be of one breed, and the Heifers of another. In Sheep, the breeds must be Leicester, Cheviot, or Blackfaced.

7. Stock of an inferior description, or which does not fall within the prescribed regulations, shall not be placed for competition.

8. An animal which has gained the Highland and Agricultural Society's first Money Premium at a previous District or General Show is inadmissible in the same Class, except in the case of Stallions, and Bulls, Tups, and Bears for the Medal; and one which has gained a second Money Premium can only thereafter compete in that Class for the first.

9. The Premiums shall not be divided. In Cattle, Horses, Sheep, and Swine, four lots in each Class will warrant the award of full, and two lots of half, Premiums. In Dairy Produce, eight Exhibitors in any one Class will warrant an award of full, and four of half, Premiums. A competitor may exhibit two lots in each Class, except in Dairy Produce, where only one lot is allowed from the same farm. For the Silver Medal to Proprietors two lots are required. To authorise the award of the Medals in the intermediate year, there must not be less than two lots in each Class.

10. The Premiums for Stallions are open to General Competition. The other Money Premiums are restricted to Tenant Farmers and Proprietors farming the whole of their own lands, and not also Owners of land to an extent exceeding L.500 per annum.

11. A Tenant or Factor may compete with Proprietors for the Silver Medal with a Bull, a Tup, or a Boar which has gained the Highland and Agricultural Society's first Money Premium at a previous District or General Show. When there is any doubt as to whether a competitor should be ranked as a Proprietor or Tenant, the point is left to the decision of the local Committee.

12. A Bull the property of two or more Tenants, may compete, although the Exhibitors may not be Joint-Tenants.

13. Bulls for which Money Premiums are awarded may be required to serve in the District at least one season; the rate of service to be fixed by the Committee, and the prizes may be withheld till the conditions are fulfilled. Premiums for the Heifers may be retained till the animals are certified to have calved.

14. Evidence must be produced that the Prize Stallions have had produce.

15. Mares must have foals at foot (except when death of foal is certified), or be entered as being in foal; in the latter case payment of the Premiums will be deferred till certificate of birth, which must be within 11 months from the date of the Show.

16. Aged Tups shall have served for at least three weeks during the previous season. All Prize Tups must serve within the district. Ewes and Gimmers must be taken from the Exhibitor's stock, and must have been bred by him in the district; and Ewes must have reared Lambs during the season. Fleeces must not be artificially coloured.

17. Should it be proved to the satisfaction of the Committee that an animal has been entered under a false name, pedigree, or description, for the purpose of misleading the Committee or Judges as to its qualifications or properties, the case shall be reported to the Directors, and submitted by them to the first General Meeting, in order that the Exhibitor may be disqualified from again competing for the Society's Premiums, and his name, if he is a member, struck from the roll.

18. When an animal has previously been disqualified by the decision of any Agricultural Association in Great Britain or Ireland, such disqualification shall attach, if the Exhibitor, being aware of the disqualification, fail to state it and the grounds thereof, in his entry, to enable the Committee to judge of its validity.

19. Competitors must certify that the Butter and Cheese exhibited by them are average specimens of the produce of their Dairies in 1877, and that the quantity produced during the season has not been less than 1 cwt. of Butter, or 2 cwt. of Cheese.

20. It is to be distinctly understood that in no instance does any claim lie against the Society for expenses attending a show of stock beyond the amount of the Premiums offered.

21. Blank reports will be furnished to the Conveners and Secretaries of the different districts. These must, in all details, be completed, and lodged with the Secretary *on or before the 1st of November next*, for the approval of the Directors, against whose decisions there shall be no appeal.

22. A report of the Competitions and Premiums awarded at the *intermediate* local shows in the several districts for Cattle and Sheep, signed by a member of the Society, must be transmitted to the Secretary *on or before the 1st of November in each year*, otherwise the Society's grants shall terminate.

23. When a grant has expired the district cannot apply again for aid for two years.

SECTION 6.—SPECIAL GRANTS.

L.50 and Medium Gold Medal to the Edinburgh Christmas Club.—Secretary,

Hugh Martin, 7 Hope Street, Edinburgh. Granted 1867.

L.50 to the Glasgow Agricultural Society for Thorough-bred Stallion.—

Mark Marshall, 116 St Vincent Street, Glasgow. Granted 1876.

L.20 to the Ayrshire Agricultural Association, to be competed for at the Dairy Produce Show at Kilmarnock—*Concours*, The Hon. G. R. Vernon, Auchans House, Kilmarnock; *Secretary*, James M'Murtrie, Ayr. Granted 1872.

L.10 to Unst Society for three consecutive years—*Concours*, Mrs Edmondston of Bunes, Unst; *Secretary*, Granted 1876.

L.3 to Rousay Society for three alternate years—*Concours*, Colonel F. W. Traill Burroughs of Rousay, C.B., Orkney; *Secretary*, John Gibson, Sangskail, Rousay. Granted 1875.

L.3 to Westray Society for three alternate years—*Concours* and *Secretary*, James Walker, Brough, Westray, Kirkwall. Granted 1876.

L.3 to Orkney Society for three consecutive years—*Concours*, David Balfour of Balfour, Kirkwall; *Secretary*, James Johnston, jun., Orphir House, Orphir, Orkney. Granted 1877.

SECTION 7.—MEDALS IN AID OF PREMIUMS GIVEN BY LOCAL SOCIETIES.

The Society, being anxious to co-operate with local Associations, will give a limited number of Medium Silver Medals annually to Societies not on the list of Cattle or Sheep Premiums, in addition to the Money Premiums awarded in the District, for—

1. Best Bull, Cow, Heifer, or Ox.
2. Best Stallion, Mare, or Gelding.
3. Best Tup, or Pen of Ewes or Wethers.
4. Best Boar, Sow, or Pig.
5. Best Coops of Poultry.
6. Best sample of any variety of Wool.
7. Best sample of any variety of Seeds.
8. Best managed Farm.
9. Best managed Green Crop.
10. Best managed Hay Crop.
11. Best managed Dairy.
12. Best Sweet Milk Cheese.
13. Best Cured Butter.
14. Best Collection of Roots.
15. Best kept Fences.
16. Male Farm-Servant who has been longest in the same service, and who has proved himself most efficient in his duties, and to have invariably treated the animals under his charge with kindness.
17. Female Servant in charge of Dairy and Poultry who has been longest in the same service, and who has proved herself most efficient in her duties, and to have invariably treated the animals under her charge with kindness.
18. Best Sheep Shearer.
19. Most expert Hedge Cutter.
20. Most expert Labourer at Draining.
21. Most expert Farm-Servant at trial of Reaping Machines.
22. Best Maker of Oat Cakes.

It is left to the local Society to choose out of the foregoing list the classes for which the Medals are to be competed.

The Medals are given for five consecutive years.

Aberdeenshire.

1. AUCHINDOIR, KILDRUMMY, and TOWIE ASSOCIATION.—*Convener*, Carlos Pedro Gordon of Wardhouse, Inch; *Secretary*, William Walker, Ardhumcart, Mossat. 4 Medals. Granted 1873.
2. CROMAR, UPPER DEE AND DONSIDER ASSOCIATION.—*Convener*, Dr Robertson, Indego, Tarland; *Secretary*, William Thomson, Banker, Tarland. 2 Medals. Granted 1873.
3. DONSIDER CLUB.—*Convener*, Sir William Forbes of Craigievar, Bart., Fintray House, Aberdeen; *Secretary*, William Wishart, Cairntraddlyn, Blackburn. 2 Medals. Granted 1877.
4. EBRIESIDE ASSOCIATION.—*Convener*, John Leith Ross of Arnage, Ellon; *Secretary*, William Stephen, Mill of Fortrie, Ellon. 2 Medals. Granted 1874.

5. **INSCH HORTICULTURAL SOCIETY.**—*Convener*, Col. Leith Hay of Rannes, C.B., Leith Hall, Kinnethmont; *Secretary*, John Gartly, Inch. 2 Medals. Granted 1874.
6. **KINCARDINE O'NEIL AND UPPER DEESIDE ASSOCIATION.**—*Convener*, Col. Innes of Learney, Torphins; *Secretary*, Alexander Jaffray, Wester Belt, Torphins. 3 Medals. Granted 1873.
7. **KINNETH MONT SOCIETY.**—*Convener*, Col. Leith Hay of Rannes, C.B., Leith Hall, Kinnethmont; *Secretary*, William Gerrard, Schoolhouse, Kinnethmont. 3 Medals. Granted 1874.
8. **MAR ASSOCIATION.**—*Convener*, Wm. Wishart, Cairntraddlyn, Blackburn, Aberdeen; *Secretary*, Silvester Campbell, Kinnellar, Blackburn, Aberdeen. 4 Medals. Granted 1874.
9. **NORTH-EAST ABERDEENSHIRE SOCIETY.**—*Convener*, Alex. Lovie, Nether Boydlie, Fraserburgh; *Secretary*, John Bell, Merryhillock, Fraserburgh. 6 Medals. Granted 1873.
10. **NORTH OF SCOTLAND ROOT, VEGETABLE, AND FRUIT ASSOCIATION.**—*Convener*, Lieut-Col. Ramsay of Barra, Straloch, Aberdeen; *Secretary*, James Smith, 14 Wardes Road, Inverurie. 2 Medals. Granted 1874.
11. **STRICHEN SOCIETY.**—*Convener*, Alex. Whitelaw, M.P.; *Secretary*, John Sleigh, Strichen. 1 Medal. Granted 1873.
12. **VALE OF ALFORD TURNIP ASSOCIATION.**—*Convener*, R. O. Farquharson of Haughton, Alford, N.B.; *Secretary*, John Reid, Bents, Alford. 2 Medals. Granted 1875.
13. **WARTHILL TURNIP CLUB.**—*Convener*, William Leslie of Warthill, Pitciple; *Secretary*, Adam Singer, Rothmaise, Inch. 2 Medals. Granted 1873.

Argyllshire.

14. **KINTYRE SOCIETY.**—*Convener*, John Lorne Stewart of Coil, Campbeltown; *Secretary*, J. L. Pearson, Campbeltown. 4 Medals. Granted 1873.
15. **LOCHBUY SOCIETY.**—*Convener*, M. G. MacLaine of Lochbuy, Oban; *Secretary*, Donald McPhail, Cameron Farm, Mull, Oban. 2 Medals. Granted 1876.

Ayrshire.

16. **ARDROSSAN SOCIETY.**—*Convener*, D. Cuninghame, Chapelton, Ardrossan; *Secretary*, James Campbell, Saltecoats. 2 Medals. Granted 1877.
17. **COYLTON AND STAIR SOCIETY.**—*Convener*, Major-General Barnett of Gadgirth, Tarbolton; *Secretary*, Robert Caddwell, Knockhoggie, Coylton, Ayr. 2 Medals. Granted 1874.
18. **CRAIGIE SOCIETY.**—*Convener*, James Picken, Laigh Langside, Craigie, Kilmarnock; *Secretary*, Andrew McFarlane, Schoolhouse, Craigie. 3 Medals. Granted 1874.
19. **CUMNOCK SOCIETY.**—*Convener*, John Hyslop of Bank, New Cumnock; *Secretary*, John Hayman, Dumfries House Mains, Cumnock. 2 Medals. Granted 1877.
20. **DALRYMPLE SOCIETY.**—*Convener*, David Hunter, Gultreehall, Kirkmichael; *Secretary*, Wm. Alston, Hopetown Cottage, Dalrymple, Ayr. 2 Medals. Granted 1876.
21. **DARVEL HORTICULTURAL SOCIETY.**—*Convener*, John Nisbet, Longgreen, Newmilns; *Secretary*, John Jamieson, East Main Street, Darvel, Kilmarnock. 2 Medals. Granted 1876.

22. GALSTON SOCIETY.—*Convener*, Alex. D. Tait of Milrig, Kilmarnock; *Secretary*, Robert Hendrie, Drumdroch, Galston. 3 Medals. Granted 1877.
23. GIRVAN DISTRICT SOCIETY.—*Convener*, Captain Hamilton of Pinmore; *Secretary*, Robert Lamb, Royal Bank, Girvan. 2 Medals. Granted 1875.
24. IRVINE SOCIETY.—*Convener*, James Stewart, Heathfield, Irvine; *Secretary*, A. C. M'Jannet, Writer, Irvine. 2 Medals. Granted 1875.
25. KILMARNOCK CLUB.—*Convener*, Frederick J. Turner, The Dean, Kilmarnock; *Secretaries*, James and W. H. Wilson, Kilmarnock. 2 Medals. Granted 1874.
26. KIRKMICHAEL SOCIETY.—*Convener*, John Rankine of Beoch, Lochlands, Maybole; *Secretary*, David Hunter, Cairnhill, Kirkmichael, Maybole. 4 Medals. Granted 1874.
27. MUIRKIRK ASSOCIATION.—*Convener*, Abram Forrest of Calderhead, Auldhouseburn, Muirkirk; *Secretary*, Alex. Donald, The Schoolhouse, Muirkirk. 6 Medals. Granted 1873.
28. NEW CUMNOCK SOCIETY.—*Convener*, John Hyslop of Bank, New Cumnock; *Secretary*, Wm. Lennox, Whitehill, New Cumnock. 4 Medals. Granted 1874.
29. SORN PARISH ASSOCIATION.—*Convener*, Charles Howatson of Dornel, Daldorch House, Mauchline; *Secretary*, David Miller, Park Terrace, Catrine. 4 Medals. Granted 1876.
30. STEWARTON SOCIETY.—*Convener and Secretary*, John Lindsay, Thornhill, Stewarton. 2 Medals. Granted 1877.
31. SYMINGTON SOCIETY.—*Convener*, Lieut.-Col. J. G. Hay Boyd of Townend, Symington, Kilmarnock; *Secretary*, Wm. Wakelin, schoolmaster, Symington, Kilmarnock. 2 Medals. Granted 1874.

Banffshire.

32. CENTRAL BANFFSHIRE CLUB.—*Convener*, William Longmore, Keith; *Secretary*, James Geddes Brown, Keith. 4 Medals. Granted 1873.
33. SPEY, AVON, AND FIDDOCHSIDE SOCIETY. — *Convener*, Sir George Macpherson Grant of Ballindalloch, Bart.; *Secretary*, W. M. Skinner, Ballindalloch. 4 Medals. Granted 1877.

Berwickshire.

34. LAMIERMOOR PASTORAL SOCIETY.—*Convener*, John Turnbull of Abbey St Bathans, 49 George Square, Edinburgh; *Secretary*, John Caverhill, Greenburn, Ayton. 2 Medals. Granted 1875.

Dumbartonshire.

35. CUMBERNAULD SOCIETY.—*Convener*, John Wm. Burns of Kilmahew, Dumbarton; *Secretary*, George Anderson, Smithstown, Croy, Kilsyth. 3 Medals. Granted 1876.
36. DUMBARTONSHIRE SOCIETY.—*Convener*, Alex. Smollett of Bonhill, Cameron House, Alexandria, N.B.; *Secretary*, Wm. W. Murray, Catter House, Drymen. 4 Medals. Granted 1873 and 1874.

Dumfriesshire.

37. ANNANDALE FARMERS' SOCIETY.—*Convener*, Christopher Johnstone, Dinwoodie Lodge, Lockerbie; *Secretary*, John Baird, jun., Lockerbie, 4 Medals. Granted 1875.

Fife-shire.

38. DUNNIKIER SOCIETY.—*Convener*, J. T. Oswald of Dunnikier, Kirkcaldy; *Secretary*, John Kidd, Dunnikier, Kirkcaldy. 3 Medals. Granted 1874.
39. WINDYGATES SOCIETY.—*Convener*, John Gilmour of Lundin, Leven; *Secretary*, John Syme, Cameron, Windygates. 2 Medals. Granted 1875.

Inverness-shire.

40. STRATHGLASS SOCIETY.—*Convener*, Lord Lovat, Beaufort Castle, Beaul; *Secretary*, James Fraser, Mauld, Beaul. 2 Medals. Granted 1876.
41. GLEN URQUHART SOCIETY.—*Convener*, The Earl of Seafield; *Secretary*, Major Grant, Drumbuie, Glen Urquhart. 3 Medals. Granted 1877.

Kincardineshire.

42. STRACHAN FLOWER, POULTRY, AND DAIRY SHOW.—*Convener*, John Masson, Mill of Cammie, Banchory; *Secretary*, Neil Gilchrist, School-house, Strachan, Banchory. 2 Medals. Granted 1874.

Lanarkshire.

43. BIGGAR CLUB.—*Convener*, John L. Murray of Heavyside, Biggar; *Secretary*, R. G. Murray, Spittal, Biggar. 3 Medals. Granted 1874.
44. CADDER SOCIETY.—*Convener*, Alexander Campbell, Crosshill, Bishopbriggs; *Secretary*, John Marshall, 93 West Regent Street, Glasgow. 2 Medals. Granted 1877.
45. CALDER WATERHEAD SOCIETY.—*Convener*, Peter Forrest of Heirmyres, City of Glasgow Bank, Shotts; *Secretary*, James Ferguson, Fairnie-shaw, Holytown. 2 Medals. Granted 1873.
46. CARMICHAEL SOCIETY.—*Convener*, Sir Windham C. J. Carmichael Anstruther, Bart., M.P., Cormiston Towers, Biggar; *Secretary*, William Bell, Sheriffflats, Thankerton. 2 Medals. Granted 1877.
47. UPPER WARD OF LANARKSHIRE ASSOCIATION.—*Convener*, Andrew Smith, Castle Mains, Douglas; *Secretary*, James Symington, auctioneer, Lanark. 2 Medals. Granted 1874.

Linlithgowshire.

48. BATHGATE ASSOCIATION.—*Convener*, John Waddell of Easter Inch, 10 St Andrew Square, Edinburgh; *Joint-Secretaries*, M. Chapman and G. M. Johnston, Bathgate. 4 Medals. Granted 1873.

Perthshire.

49. DUNNING SOCIETY.—*Convener*, Lord Rollo, Duncrub House, Dunning; *Secretary*, William Bruce, merchant, Dunning. 1 Medal. Granted 1873.
50. MOULIN ASSOCIATION.—*Convener*, Alex. Forbes, Pitfaurie, Pitlochrie; *Secretary*, D. McGillewie, Balmadrin, Pitlochry. 1 Medal. Granted 1873.

Renfrewshire.

51. LOWER WARD OF RENFREWSHIRE SOCIETY.—*Convener*, Sir Michael R. Shaw Stewart of Ardgowan, Bart., Greenock; *Secretary*, D. L. Macadam, Mansion House, Greenock. 4 Medals. Granted 1873.
52. MEARNS SOCIETY.—*Convener*, William Mather of Waterfoot, Mearns; *Secretary*, John Pollok, Blackhouse, Newton Mearns. 2 Medals. Granted 1874.

53. NEILSTON SOCIETY.—*Convener*, John Holm, Jaapston, Neilston; *Secretary*, A. Robertson Ferguson, Clydesdale Bank, Neilston. 2 Medals. Granted 1876.

Ross-shire.

54. WESTER ROSS CLUB.—*Convener*, Sir Kenneth S. Mackenzie of Gairloch, Bart., Canon House, Dingwall; *Secretary*, David Ross, Dingwall. 4 Medals. Granted 1877.

Stirlingshire.

55. BUCKLYVIE AND GARTMORE ASSOCIATION.—*Convener*, W. A. MacLachlan of Auchentroig, Balfroun; *Secretary*, Andrew Dun, Kepadwrie, Bucklyvie. 2 Medals. Granted 1875.

56. GARGUNNOCK SOCIETY.—*Convener*, Sir Henry J. Seton Steuart of Allanton, Bart., Stirling; *Secretary*, Thomas Leishman, Meiklewood, Stirling. 2 Medals. Granted 1877.

Wigtownshire.

57. KIRKMAIDEN SOCIETY.—*Convener*, Gilbert R. Murray, Chapelrossan, Stranraer; *Secretary*, James Cochrane, Logan, Ardwell. 4 Medals. Granted 1873.

The Medals are given for five consecutive years.

Applications from other Districts must be lodged with the Secretary of the Society *by 1st November next*.

RULES OF COMPETITION.

1. All competitions must be at the instance of a local Society.
2. The classes for which Medals are granted must be in accordance with the list at page 38. The Committee shall select the classes, and specify them in the return.
3. In each District the Convener (who must be a Member of the Society appointed by the Directors) shall fix the time and place of Competition, appoint the Judges, and make all other necessary arrangements, in concurrence with the other Members of the Society, and the local Association of the District.
4. The Money Premiums given in the District must be L.2 for each Medal claimed.
5. The Medal for Sheep Shearing shall not be awarded unless there are three competitors, and it shall always accompany the highest money premium. There must not be fewer than two competitors in all the classes.
6. Blank reports will be furnished to all the Conveners of the different Districts. These must, in all details, be completed and lodged with the Secretary *on or before the 1st of November next*, with the exception of green crop reports, which must be forwarded on or before the 20th of December, for the approval of the Directors, against whose decisions there shall be no appeal.
7. When a grant has expired, the District cannot apply again for aid for two years.

SECTION 8.—PLOUGHING COMPETITIONS.

The Minor Silver Medal will be given to the winner of the first or highest Premium at Ploughing Competitions, provided a Report in the following terms is made to the Secretary, within one month of the Competition, by a Member of the Society:—

FORM OF REPORT.

I, _____ of _____ Member of the Highland and Agricultural Society, hereby certify that I attended the Ploughing Match of the _____ Association at _____ in the county of _____ on the _____ when _____ ploughs completed; _____ of land was assigned to each, and _____ hours were allowed for the execution of the work. The sum of L. _____ was awarded in the following proportions, viz:—

[Here enumerate the names and designations of successful Competitors.]

RULES OF COMPETITION.

1. All Matches must be at the instance of a local Society or Ploughing Association, and no Match at the instance of an individual, or confined to the tenants on one estate, will be recognised.

2. The title of such Society or Association, together with the name and address of the Secretary, must be registered with the Secretary of the Highland and Agricultural Society, 3 George IV. Bridge, Edinburgh.

3. Not more than one Match in the same season can take place within the bounds of the same Society or Association.

4. All reports must be lodged within one Month of the date of the Match, and certified by a Member of the Society who was present at it.

5. A Member can only report one Match, and a Ploughman can only carry one Medal in the same season.

6. To warrant the Medal, there must have been twelve ploughs in Competition, and Three Pounds awarded in Premiums. The Medal to be given to the winner of the first or highest prize.

7. Ploughmen shall not be allowed any assistance, and their work must not be set up nor touched by others: on land of average tenacity the ploughing should be at the rate of an imperial acre in ten hours, and attention should be given to the firmness and sufficiency of the work below, more than to its neatness above the surface.

SECTION 9.—COTTAGES AND GARDENS.

The following Premiums are offered for Competition in the Parishes after mentioned.

The Premiums for Cottages and Gardens are given for five consecutive years.

I. PREMIUMS FOR BEST KEPT COTTAGES AND GARDENS.

1. Best kept Cottage—One Pound; and where there are four Competitors—Minor Silver Medal.

Second best—Ten Shillings.

Third Best—Minor Silver Medal.

2. Best kept Cottage Garden—One Pound; and where there are four Competitors—Minor Silver Medal.

Second best—Ten Shillings.

Third best—Minor Silver Medal.

PREMIUMS OFFERED BY THE SOCIETY IN 1877.

Aberdeenshire.

METHLIC HORTICULTURAL SOCIETY.—*Convener*, James Cochrane, Little Haddo, Newburgh, Aberdeen ; *Secretary*, George Moir, jun., Methlic. Granted 1877.

Fifeshire.

2. NEWBURGH GARDENING SOCIETY.—*Convener*, John Lyell, Newburgh on Tay ; *Secretary*, Robert Clark, Newburgh-on-Tay. Granted 1874.

Kincardineshire.

3. FETTERCAIRN AMATEUR HORTICULTURAL SOCIETY.—*Convener*, Lieut.-Col. McInroy of The Burn, Brechin ; *Secretary*, James Robb, Fettercairn. Granted 1875.

Linlithgowshire.

4. KIRKLISTON HORTICULTURAL ASSOCIATION.—*Convener*, Peter Glendinning, Dalmeny Park, Edinburgh ; *Secretary*, Granted 1874.

Perthshire.

5. DUNBARNEY, including that portion of Craigend in the parish of Perth.—*Convener*, Sir Thomas Moncreiffe of Moncreiffe, Bart., Bridge of Earn ; *Secretary*, Henry Methven, Dunbarney House, Bridge of Earn. Granted 1874.

6. FORGANDENNY.—*Convener*, T. T. Oliphant of Rossie, Bridge of Earn ; *Secretary*, A. M. Nicholson, Eastfield, Forgandenny, Bridge of Earn. Granted 1877.

7. MUTHILL HORTICULTURAL SOCIETY.—*Convener*, Henry Curr, Pitkellony, Muthill ; *Secretary*, Malcolm Finlayson, Pitkellony Office, Muthill. Granted 1877.

RULES OF COMPETITION.

1. Competitions may take place in the different parishes for Cottages and Gardens, or for either separately.

2. The occupiers of Gentlemen's Lodges and Gardeners' Houses, as well as Gentlemen's Servants occupying Cottages in the Policies, or on land in the natural possession of their masters, are excluded, as well as others whom the Committee consider, from their position, not to be entitled to compete. The inspection must be completed by the 1st of October. In making the inspection, the Conveners may take the assistance of any competent judges.

3. It is left to the Committee of the district to regulate the maximum annual rent of the Cottages, which may, with the garden, be from L.5 to L.7.

4. A person who has gained the highest premium cannot compete again, but will be entitled to a Medal if certified by the Committee to be equal in merit to the first on the list of Competitors.

5. If the Cottage is occupied by the proprietor, the roof must be in good repair; if the roof is of thatch, it must be in good repair, though in the occupation of a tenant. The interior and external conveniences must be clean and orderly—the windows must be free of broken glass, clean, and affording the means of ventilation. Dung-hills, and all other nuisances, must be removed from the front and gables. In awarding the Cottage Premiums, preference will be given to Competitors who, in addition to the above requisites, have displayed the greatest taste in ornamenting the exterior of their houses, and the ground in front and at the gables.

6. In estimating the claims for the Garden Premiums, the judges should have in view:—The sufficiency and neatness of the fences and walks; the cleanness of the ground; the quality and choice of the crops; and the general productiveness of the garden.

7. Reports, stating the number of Competitors, the names of successful parties, and the nature of the exertions which have been made by them, must be transmitted by the Conveners to the Secretary *on or before the 1st November next*.

8. When a grant has expired the District cannot apply again for aid for two years.

Parishes desirous of these Premiums must lodge applications with the Secretary *on or before the 1st November next*.

2. MEDALS FOR COTTAGES AND GARDENS OR GARDEN PRODUCE.

The Society will issue annually two Medium Silver Medals to a limited number of local Associations or individuals, who at their own expense establish premiums for Cottages or Gardens under L.15 of Rent. The Medals may be awarded for best kept Cottage, and best kept Garden or Flower Plot, or Garden Produce.

Local Associations or individuals desirous of these Medals, must lodge applications with the Secretary *on or before the first November next*. The Medals are given for five consecutive years.

Aberdeenshire.

1. KEIG CLUB.—*Convener*, Lord Forbes, Castle Forbes, Keig, Aberdeen; *Secretary*, George Bruce, Wealthiton, Keig. Granted 1873.

Ayrshire.

2. STEWARTON FARMER SOCIETY.—*Convener and Secretary*, John Lindsay, Avenue Square, Stewarton. Granted 1875.

Edinburghshire.

3. ROSLIN HORTICULTURAL SOCIETY.—*Convener*, William Merricks, Roslin; *Secretary*, David M. Law, Roslin. Granted 1874.

Fifehire.

4. AUCHTERMUCHTY AND STRATHMIGLO HORTICULTURAL SOCIETY.—*Convener*, R. Cathcart of Pitcairlic; *Secretary*, John Clark, Auchtermuchty. Granted 1875.
5. DYSART HORTICULTURAL SOCIETY.—*Convener*, James T. Oswald of Dumnikier, Kirkcaldy; *Secretary*, John Watson, Dysart. Granted 1877.

Invernessshire.

6. BADENOCH AND ROTHENMURCHUS HORTICULTURAL SOCIETY.—*Convener*, Cluny Macpherson, Cluny Castle, Kingussie; *Secretary*, William Forrest, Kingussie. Granted 1876.

Kincardineshire.

7. FORDOUN, GLENBERVIE, AND ARBETHNOTT HORTICULTURAL SOCIETY.—*Convener*, Lord Inverurie, Inglismabie Castle, Laureneekirk; *Secretary*, Alexander Cruickshank, gardener, Glenbervie House, Fordoun. Granted 1876.

Linarkshire.

8. ALBERT GARDENS ASSOCIATION, GLASGOW. — *Secretary*, George D. Miller, 16 Mathieson Street, Glasgow. Granted 1877.

9. BOTHWELL HORTICULTURAL SOCIETY.—*Convener*, Dr Bruce Goff, Woodlea, Bothwell; *Secretary*, Wm. M'Nab, City of Glasgow Bank, Bothwell. Granted 1876.
10. HUTCHESONTOWN GARDENS.—*Secretary*, Robert Hamilton, 62 Camden Street (Southside), Glasgow. Granted 1872. (One year in abeyance).

REGULATIONS.

1. Competitions may take place in the different districts for Cottages and Gardens, or for either separately.
2. The annual value of each Cottage, with the ground occupied in the parish by a Competitor, must not exceed L.15.
3. If Competition takes place for Garden Produce in place of the best kept Garden, such produce must be *bona fide* grown in the Exhibitor's Garden, and he will not be allowed to make up a Collection from any other Garden.
4. Blank reports will be furnished to the Conveners and Secretaries of the different Districts. These must, in all details, be completed and lodged with the Secretary *on or before the 1st November next*, for the approval of the Directors, against whose decisions there shall be no appeal.
5. When a grant has expired the District cannot apply again for aid for two years.

3. IMPROVING EXISTING COTTAGES.

To the Proprietor in Scotland who shall report the Improvement of the greatest number of Cottages during the years 1874, 1875, and 1876—The Gold Medal.

4. BUILDING NEW COTTAGES.

To the Proprietor in Scotland who shall report the erection of the greatest number of approved Cottages during the years 1873, 1874, 1875, and 1876—The Gold Medal.

RULES OF COMPETITION.

1. Claims for the Premiums Nos. 3 and 4 must be lodged with the Secretary on or before the 1st of October next, to allow an inspection to be made of the different Cottages. The inspection will be conducted by a Committee of the Society's Members, and Reports must be transmitted to the Secretary *on or before the first of November*.
2. The annual value of the Cottage or Cottages separately, with the garden ground, must not exceed L.5.
3. In estimating the claims of the Competitors, the following points will be kept in view:—The external appearance of the Cottages; their internal accommodation; the arrangements of the out-houses; the means of drainage and ventilation; and the expense of the building or of the alteration, compared with its durability and accommodation. When the Cottages of one Competitor are superior in style and comfort to those of another, though not so numerous, the Inspectors will give them the preference, provided they amount at least to three, and have been erected at a moderate expense.
4. Parties competing will forward to the Society Plans, Specifications, and Estimates, of which, and of all information sent therewith, copies may be taken for publication, if the Society shall see fit, and the originals returned to the parties within six months, if desired.

GENERAL SHOW OF STOCK AND IMPLEMENTS

AT

EDINBURGH

ON 24TH, 25TH, 26TH, AND 27TH JULY 1877.

President of the Society.

THE MOST NOBLE THE MARQUIS OF LOTHIAN.

Chairman of the Local Committee.

ROBERT DUNDAS, ESQ. OF ARNISTON.

The District connected with the Show comprises the Counties of
EDINBURGH, HADDINGTON, and LINLITHGOW.

REGULATIONS.

GENERAL CONDITIONS.

1. Members of the Society are admitted to the Show-Yard without payment, on exhibiting a "*Member's Ticket*." Tickets will be sent to all Members residing in the Counties connected with the Show. Members residing in other localities must apply for Tickets at the Secretary's Office, 3 George-IV. Bridge, Edinburgh, *not later than the 17th of July*.

2. The Competition is open to Exhibitors from all parts of the United Kingdom. New Members may be proposed for election at the General Meeting in June, and if on the list of Candidates may enter at Members' rates; but all entries must be made on or before Wednesday, 6th June.*

3. Every Lot must be intimated by a Certificate of Entry, lodged with the Secretary *not later than Wednesday, the 6th of June*. Printed forms will be issued on application to the Secretary, No. 3 George IV. Bridge, Edinburgh. Admission Orders will be forwarded to Exhibitors, by post, previous to the Show.

4. Protests against the awards of the Judges must be lodged with the Secretary not later than 9 A.M. on Wednesday, 25th July, and parties must be in attendance at the Committee-Room, in the Show-Yard, at 10 A.M. that day, when protests will be disposed of.

5. Protests lodged for causes which the protestor produces no good evidence to substantiate, will render him liable to be reported to the Board of Directors, with the view, if they see reason, to his being prohibited from again entering stock for a General Show.

* According to the Charter, a Member who homologates his Election by paying his first subscription cannot retire until he has paid, in annual subscriptions or otherwise, an amount equivalent to a life composition.

6. The Society shall not be liable for any loss or damage which Stock, Poultry, Implements, or other articles may sustain at the Show, or in transit.

7. The decisions of the Board of Directors are final in all questions respecting Premiums, and it shall not be competent for any Exhibitor to appeal against such decisions to, nor seek redress in respect of them from, any other tribunal.

8. Covered Booths for Offices, purely for business, not for exhibition of goods, can be had from £3, 10s. to Members, and £5 to Non-Members, according to size. Intimation to be made to the Secretary before the 1st of July.

9. No lights allowed in the Yard at night, and Smoking is strictly prohibited within the sheds. Those infringing this Rule will be fined 10s.

10. As the command of water in the Yard is limited, it is particularly requested that waste be avoided.

11. When the ground requires to be broken, the turf must be carefully lifted and laid aside, and the surface must be restored to the satisfaction of the Society, and at the expense of the Exhibitor.

12. All persons admitted into the Show-Yard shall be subject to the Rules and Orders of the Directors.

13. The violation by an Exhibitor of any one of the Regulations will involve the forfeiture of all Premiums awarded to him.

14. Railway Passes for unsold stock and implements must be applied for at the Committee Room in the Yard between 9 and 11 o'clock on the forenoon of Thursday and Friday.

15. The Show terminates at 5 P.M. on Friday, and no animal or article can be withdrawn before that hour. Stock and Implements may remain in the Yard till Saturday afternoon.

16. The Premiums awarded will be paid in November 1877, and, with the exception of Silver Medals, may be taken either in money or in plate.

STOCK AND POULTRY.

17. Stock and Poultry to be entered with the Secretary on or before Wednesday, 6th June. Received in the Yard on Monday, 23d, and till 10 A.M. on Tuesday, 24th July. Judged at 11 A.M. on Tuesday. Exhibited on Tuesday, Wednesday, Thursday, and Friday, 24th, 25th, 26th, and 27th July.

18. No animal to be allowed to compete in more than one section, except Horses in Sections 13, 14, 15, 16, and 18, which may be also entered in Section 19.

19. All animals must be entered in the sections applicable to their ages, and cannot be withdrawn after entry.

20. Stock must be *bona fide* the property and in the possession of the Exhibitor from the 6th June (the last day of Entry).

21. The schedule of Entry must be filled up so far as within the knowledge of the Exhibitor.

22. The name of the Breeder, if known, must be given, and if the Breeder is not known a declaration to that effect, signed by the Exhibitor, must be sent along with the Schedule, and no pedigree will be entered in the Catalogue when the Breeder is unknown.

23. Should it be proved to the satisfaction of the Directors that an animal has been entered under a false name, pedigree, or description, for the purpose of misleading the Directors or Judges as to its qualification or properties, the case shall be reported to the first General Meeting, in order that the Exhibitor shall be disqualified from again competing at the Society's Shows, and his name, if he be a Member, struck from the roll.

24. When an animal has previously been disqualified by the decision of any

Agricultural Association in Great Britain or Ireland, such disqualification shall attach, if the Exhibitor, being aware of the disqualification, fail to state it, and the grounds thereof, in his entry, to enable the Directors to judge of its validity.

25. Breeding Stock must not be shown in an improper state of fatness, and the Judges will be prohibited from awarding Premiums to overfed animals.

26. The Competition of Thorough-bred Stallions takes place in spring.

27. No animal shall bear on its rug, harness, pail, or other fittings, any initial, crest, or mark of ownership, nor be distinguished otherwise than by the number indicating its place in the Catalogue.

28. Any artificial contrivance or device of any description found on an animal either for preventing the flow of milk or for any other purpose, will disqualify that animal from being awarded a Premium, and the Owner of said animal will be prohibited from again entering stock for any of the Society's General Shows.

29. No animal to be taken out of its stall after 10 A.M. during the Show, except by order of the Judges, or with permission of the Secretary. Those infringing this Rule will be fined 10s.

30. Aged Bulls and Stallions must have had produce, and, along with Two-year-old Bulls and Three-year-old Colts, have served within the year of the Show.

31. All Cows must have had calves previous to the Show, and when exhibited, they must either be in milk or in calf; if in milk, birth must have been within 9 months of the Show; if in calf, birth must be certified within 9 months after the Show. In the case of Ayrshire Heifers in Calf, calved before 1st January 1875, birth must be certified within 9 months after the Show.

32. All Milch Cows must have been milked dry the evening previous to being judged, and they must, while within the Show-Yard, be milked morning and evening. The Judges will be instructed to withhold the prizes from any animals overstrained or suffering from want of being milked.

33. Two-year-old Heifers—of the Short-horn and Polled Breeds—must be in calf when exhibited, and the premiums will be withheld till birth be certified, which must be within 9 months after the Show. Animals of any age that have had a calf must be shown as Cows.

34. Mares in Section 5 and 12 must have produced foals after 1st January 1-77, and foals must be at foot, except when death can be proved. Mares in Section 6 must be in foal, and awards will be suspended till birth is certified, which must be within 11 months from the date of the Show.

35. With reference to regulations 32 and 33, birth of at least a seven months' calf must be certified; and in regard to regulation 34, birth of at least a nine months' foal.

36. Horses entered as suitable for Field are expected to be jumped in the Horse Ring, but this is not compulsory except when the animals are being judged, and then only if required by the Judges. Those entered for leaping must be jumped in the Horse-Ring at each Parade during the Show.

37. The inspection of Horses as to soundness is left entirely to the Judges, who may consult the Society's Veterinary Surgeon if they deem it expedient.

38. No protests on veterinary grounds will be received.

39. All Ewes must have reared Lambs in 1877; and Ewes in Sections 4 and 9 (Cheviot and Blackfaced) must be in milk, and have their Lambs at foot. Fleeces must not be artificially coloured.

40. Sows must have reared pigs in 1877, or be in pig; and Pigs must belong to the same litter, and be mment.

41. In Poultry the Aged Birds must have been hatched previous to, and Cockerels and Pullets in, 1877. In the sections for Ducks, Turkeys, Geese, and Hens and Pullets of the Game and Malay Breeds, the lots to consist of one bird only.

42. An animal which has gained a first premium at a General Show of the Society cannot again compete in the same section.

43. The Yard will be open for Stock on Monday, 23th July, and between Six and Ten o'clock on the morning of Tuesday, 24th, after which hour no Stock can be admitted.

44. Bulls must be secured by nose rings, with chains or ropes attached, or with strong halters and double ropes, with a man on each side.

45. Servants in charge of Stock must bring their own buckets or pails, and a piece of rope to carry their forage.

46. Closed-in stables will be provided for all the horses, and covered accommodation for the whole of the other stock. Night accommodation will be provided for Attendants on Stock, and those requiring the same must make application when they return their Entry Schedules, and remit the charge along with their stall rent.

47. Straw, hay, grass, and tares will be provided free by the Society during the four days of the Show; other kinds of food will be supplied at fixed prices in the forage yard. Coops, food, and attendance for Poultry will be found by the Society. Any Servant removing bedding from an adjoining stall will be fined in double the amount taken. Exhibitors may fetch their own cake or corn to the Yard, but not grass, tares, hay, nor straw.

48. Cattle, Sheep, Swine, or Poultry cannot be removed from the Yard till 5 p.m. on Friday, 27th July, except on certificate by the Veterinary Surgeon employed by the Directors.

49. Horses may be withdrawn at 6 each evening on a deposit of £2 for each animal, which shall be forfeited if the animal is not brought back at half-past 7 o'clock the following morning. Those not in before 8 will forfeit 10s. Horse passes to be applied for at the Committee Rooms between 5 and 6 on Tuesday, and the deposit will be returned between 10 and 11.30 on Friday.

50. When the Stock is leaving the Yard, no animal is to be moved till ordered by those in charge of clearing the Yard. Those transgressing this Rule will be detained till all the other Stock is removed.

JUDGING STOCK.

51. On Tuesday, 24th July, Exhibitors, and all others except Servants in charge of Stock, must leave the Yard at 10 A.M.

52. The Judges will commence their inspection at 11 A.M., when the public will be admitted. In no case shall a Premium be awarded unless the Judges deem the animals to have sufficient merit; and where only one or two lots are presented in a section, and the Judges consider them unworthy of the premiums offered, it shall be in their power to award a lower prize, or to suggest the removal of any lot which appears to them unworthy of being placed in the Yard.

53. In addition to the Premiums, the Judges are authorised to award three Commendations in each section (except Poultry, where only two prizes are to be awarded) if the entries are numerous and the animals of sufficient merit. These Commendations to consist of—Very Highly Commended, Highly Commended, and Commended.

54. The animals in Section 22 (Ayrshire Breed) which have not calved before the Show will be judged along with Cows in Calf, and those in Section 23 which have calved before the Show will be judged along with Cows in Milk.

55. Two Members of Committee will attend each Section of the Judges. It will be their duty to see that no obstruction is offered to them, and that the space reserved for them is not encroached on; to communicate to the Secretary any question that may arise for the consideration of the Committee; to complete their reports; and to ticket the prize animals.

56. It shall not be competent for any Exhibitor, nor for his Factor or Land-Steward, to act as a Judge or Attending Member in any class in which he is competing; and no Exhibitor shall remain in charge of any lot, whether belonging to himself or another, while the Judges are in the Yard.

STALL RENT.

57. The following rates shall be paid by Exhibitors when making their Entries:—

	Members.		Non-Members.	
	s.	d.	s.	d.
Cattle,	15	0	25	0
Stallions—3 and 2 year old entire Colts,	30	0	35	0
All other Horses,	20	0	30	0
Sheep, per pen,	10	0	15	0
Swine, per pen,	15	0	20	0
Poultry, each entry,	4	0	6	0
Night accommodation for Attendants, each,	12	0	15	0

IMPLEMENTS AND MACHINERY.

58. Implements to be entered with the Secretary on or before Wednesday, 6th June. Received in the Yard on Tuesday, 17th July, and till ten o'clock on the morning of Tuesday, 24th July. Exhibited Tuesday, Wednesday, Thursday, and Friday, 24th, 25th, 26th, and 27th July.

59. Money Prizes or Medals are restricted to new inventions, or improvements, on Implements of Agriculture, Horticulture, and Forestry.

60. Implements will be placed in the following sections, viz.:—1st, Closed-in stalls; 2d, all under cover; 3d, new inventions and improvements under cover; 4th, part under cover and part open; 5th, all open; 6th, motion yard; and Exhibitors must intimate in which section their Exhibits are to be placed, and specify the space they require.

61. Articles for the class of "New Inventions and Improvements" must be *entered* in the name of the inventor himself, or by an authorised agent, and accompanied by a specification of the invention or improvement claimed by him. All new inventions and improvements, with the exception of those in motion, will be placed in the catalogue by themselves and arranged in a section apart from the other Entries of the Exhibitors. The space required therefore for these new inventions, and improvements, must be stated separately. Exhibitors of New Inventions and Improvements, or their authorised agents, must be present and remain at their stalls during the judging on Tuesday to afford any explanation required. If they are absent when the judges make their inspection, the articles exhibited by them will not be reported on.

62. The articles of each Exhibitor will be all placed in one stand, except new inventions, improvements, and implements in motion, and must not on any account extend beyond the width allowed. No article to be moved out of its stand till the termination of the Show.

63. All Machines requiring steam or fire must be entered as such in the Certificate, and will be placed in the Motion Yard. The space required for Implements in the Motion Yard must be stated separately.

64. Exhibitors must on no account leave their stands during the judging of Stock, and if found in the Stock Yard they will be fined 10s.

65. The official duties of the Implement Committee shall be limited to the inspection of the New Inventions and Improvements, and they may award such Minor Gold or such Silver Medals as they see fit after due trial or otherwise.

66. If the Committee consider a new invention or improvement worthy of higher reward, or if they consider it necessary that its merits should be tested by actual trial after the Show, they will report the same to the Directors for their consideration; and in the event of a trial being ordered, it will be instituted in a convenient locality, and at a season of the year suitable for the operation of the implement or machine, which, when thoroughly tested, will

be entitled to such a Premium as the Directors may see fit to award, on the report of the Judges.

67. Should the Committee consider that an Implement has been entered as a new invention, or improvement, which does not deserve to bear that description, they shall report the same to the Secretary, to be brought before the Deputation of Directors for investigation; and if it is found not to be a new invention or improvement, the Exhibitor may be ordered to remove it from the yard.

68. Collections of articles not Agricultural will be received for Exhibition, but the Secretary shall be entitled to refuse Entries from dealers in articles not deemed worthy of Exhibition.

69. There must be attached to each Implement, when forwarded to the Show, a label bearing the Exhibitor's name, and that of the implement.

70. The carriage of all Implements must be prepaid.

71. Exhibitors must arrange their own articles *within* the space allotted to them before 11 o'clock on Tuesday the 24th, and to the satisfaction of the gentlemen in charge of the Implement Yard.

72. No Steam Engine shall be driven in the Yard at a greater speed than 6 miles an hour.

73. Locomotive and Traction Engines and other Machines must not be moved from their places without permission of the Secretary, and must not leave the Yard at the close of the Show till 5.30 p.m.

74. Coke must be used in all cases where fire is required.

75. No smaller space than 6 feet frontage (20 feet deep, or in Motion Yard 50) can be allowed for Implements, and, except in the closed-in stalls, no boarding shall exceed 4 feet in height.

76. Implement Exhibitors who are Members of the Society are entitled to 20 feet by 20 free; for additional space the charge is as follows:—

	Members.	Non-Members.
Implement Shedding, 20 feet deep, per foot . . .	3 0	4 0
Implements without Shedding, 20 feet deep, per foot . . .	1 0	2 0
Implements in Motion Yard, 50 feet deep, per foot . . .	2 6	5 0
Implement Shedding in Motion Yard according to agreement.		

ADMISSION OF PUBLIC.

The public will be admitted on Tuesday, 24th July, at 11 A.M., when the inspection by the Judges commences. Holders of Members' Tickets are admitted free; Exhibitors of Stock (not Members) will be charged 5s. for admission to the judging; all others 10s. The space reserved for the Judges will be enclosed by ropes, and no encroachment will be permitted.

Exhibitors of Implements and their attendants will be entitled to free entry during the Show, but must remain at their stalls during the judging of the stock on Tuesday.

On Wednesday, at 8 A.M., and throughout the Show, holders of Members' Tickets and Exhibitors will be admitted free.

The charges to others will be—Wednesday, from 8 A.M. till 5 P.M., 2s. 6d.; Thursday, from 8 A.M. till 1 P.M., 2s. 6d., after 1 o'clock, 1s.; Friday, from 8 A.M. till 12 noon, 1s., and from 12 till 5 P.M. 6d.

Placards are prohibited both inside the Show-Yard and on the outside of the Boundary Fence, with the exception of those belonging to Exhibitors, whose right is confined to their own stalls. No newspapers or any other article allowed to be carried about the Yard for sale. No strolling bands admitted.

Premium Lists, Regulations, and Certificates of Entry, may be obtained by applying at the Secretary's Office, No. 3 George IV. Bridge, Edinburgh.

No Carriages or Equestrians admitted without special leave from the Directors, and then only for Invalids. Bath chairs may be brought in.

All Communications should be addressed to FLETCHER NORTON MENZIES, Esq., Secretary of the Highland and Agricultural Society of Scotland, No. 3 George IV. Bridge, Edinburgh.

LAST DAY OF ENTRY—WEDNESDAY, 6TH JUNE.

RAILWAY ARRANGEMENTS.

The Caledonian, North British, and Glasgow and South-Western Railway Companies have adopted the following regulations:—

1. Stock and Implements to the Show to be charged full rates.
2. From the Show, if sold, full rates.
3. From the Show, if unsold, to be conveyed back at one-half the ordinary charge to the station whence they were sent, on production of a certificate from the Secretary of the Show, to the effect that they are really unsold. (*This Regulation applies only if the Traffic is conveyed by Goods Trains, there being no reduction in the ordinary rates when it is conveyed by Passenger Trains.*)
4. Parties requiring the exclusive use of a Horse-box for only one animal, to be charged one fare and a half.
5. Poultry.—The Companies give notice that they are not common carriers of poultry; they will, however, to accommodate the public, carry such by special agreement only, and at special rates, to be obtained at the Companies' stations.
6. Dogs to be charged full rates both ways.
7. All the above to be carried at owners' risk.
8. Collection and Delivery to be performed in all cases by the owners.

The Highland, Great North of Scotland, and the North Eastern Railway Companies have adopted the following Clearing-House Regulations:—

1. Stock and implements to the Show to be charged full rates.
2. From the Show, if sold, full rates.
3. From the Show, if unsold, to be conveyed at *half rates* back to the station whence they were sent, on production of a certificate from the Secretary of the Agricultural Show to the effect that they are really unsold.
4. All the above to be carried at owners' risk.
5. When agricultural machines and implements are carried under these regulations to and from Shows, they must be invoiced station to station at the ordinary rates. Collection and delivery at sending station, and delivery to, or collection from, the Show-Yard to be performed by, or at the expense of the owners.
6. Regulations Nos. 1, 2, and 3, as to Cattle and Horses, to apply only if the traffic be conveyed in Cattle Waggon and by Goods Trains.
7. Poultry and Dogs to be charged full rates both ways.
8. No reduction in the ordinary rates for Horses or Cattle when conveyed in Horse-boxes.
9. Parties requiring the exclusive use of a Horse-box for only one animal to be charged one fare and a half.

PREMIUMS.

The Medium Gold Medal will be given to any animal which, having gained the Society's highest Premium at Glasgow 1875, and Aberdeen 1876, in the Classes of Aged Bulls—Cows—Stallions—or Mares, is disqualified from again competing.

In addition to the Premiums, the Judges are authorised to award three Commendations in each section (except Poultry, where only two prizes are to be awarded) if the entries are numerous, and the animals of sufficient merit. These Commendations to consist of—Very Highly Commended, Highly Commended, and Commended.

CLASS I.—CATTLE.

SECTION	SHORT-HORN.	
1.	Best Bull calved before 1st Jan. 1875,	£25
	Second best,	15
	Third best,	10
	Breeder of best Bull, The Silver Medal.	
2.	Best Bull calved after 1st Jan. 1875,	25
	Second best,	15
	Third best,	10
3.	Best Bull calved after 1st Jan. 1876,	15
	Second best,	10
	Third best,	5
4.	Best Cow of any age,	20
	Second best,	10
	Third best,	5
5.	Best Heifer calved after 1st Jan. 1875,	15
	Second best,	10
	Third best,	5
6.	Best Heifer calved after 1st Jan. 1876,	10
	Second best,	8
	Third best,	4
		<hr/>
		£217

POLLED ANGUS OR ABERDEEN.

7.	Best Bull calved before 1st Jan. 1875,	£20
	Second best,	10
	Third best,	5
	Breeder of best Bull, The Silver Medal.	
8.	Best Bull calved after 1st Jan. 1875,	20
	Second best,	10
	Third best,	5
		<hr/>
	Carry forward	£70
		<hr/>
		£217

POLLED ANGUS OR ABERDEEN—*continued.*

SECTION	Brought forward,	£70	£217
9. Best Bull calved after 1st Jan. 1876,		10	
Second best,		5	
Third best,		3	
10. Best Cow of any age,		20	
Second best,		10	
Third best,		5	
11. Best Heifer calved after 1st Jan. 1875,		10	
Second best,		6	
Third best,		4	
12. Best Heifer calved after 1st Jan. 1876,		8	
Second best,		5	
Third best,		3	
		<hr/>	159

GALLOWAY.

13. Best Bull calved before 1st Jan. 1875,		20	
Second best,		10	
Third best,		5	
Breeder of best Bull,	The Silver Medal.		
14. Best Bull calved after 1st January 1875,		20	
Second best,		10	
Third best,		5	
15. Best Bull calved after 1st Jan. 1876,		10	
Second best,		5	
Third best,		3	
16. Best Cow of any age,		20	
Second best,		10	
Third best,		5	
17. Best Heifer calved after 1st Jan. 1875,		10	
Second best,		6	
Third best,		4	
18. Best Heifer calved after 1st Jan. 1876,		8	
Second best,		5	
Third best,		3	
		<hr/>	159

AYRSHIRE.

19. Best Bull calved before 1st Jan. 1875,		20	
Second best,		10	
Third best,		5	
Breeder of best Bull,	The Silver Medal.		
20. Best Bull calved after 1st Jan. 1875,		20	
Second best,		10	
Third best,		5	
21. Best Bull calved after 1st Jan. 1876,		10	
Second best,		5	
Third best,		3	
		<hr/>	
	Carry forward,	£88	£595

AYRSHIRE—*continued.*

SECTION	Brought forward,	£88	£535
22. Best Cow in Milk of any age,		20	
Second best,		10	
Third best,		5	
23. Best Cow in Calf, of any age, or Heifer in Calf, calved before 1st Jan. 1875,		15	
Second best,		10	
Third best,		5	
24. Best Heifer calved after 1st Jan. 1875,		10	
Second best,		6	
Third best,		4	
25. Best Heifer calved after 1st Jan. 1876,		8	
Second best,		5	
Third best,		3	
		—	189

HIGHLAND.

26. Best Bull calved before 1st Jan. 1874,		20	
Second best,		10	
Third best,		5	
Breeder of best Bull, The Silver Medal			
27. Best Bull calved after 1st Jan. 1874,		20	
Second best,		10	
Third best,		5	
28. Best Bull calved after 1st Jan. 1875,		10	
Second best,		5	
Third best,		3	
29. Best Cow of any age,		15	
Second best,		8	
Third best,		4	
30. Best Heifer calved after 1st Jan. 1874,		10	
Second best,		5	
Third best,		3	
31. Best Heifer calved after 1st Jan. 1875,		8	
Second best,		4	
Third best,		2	
		—	147

FAT STOCK.

32. Best Highland Ox calved after 1st Jan. 1873,	£6	
Second best,	3	
33. Best Highland Ox calved after 1st Jan. 1874,	5	
Second best,	2	
34. Best Polled Ox calved after 1st Jan. 1874,	6	
Second best,	3	
35. Best Polled Ox, calved after 1st Jan. 1875,	5	
Second best,	2	
	—	—
Carry forward	£82	£871

FAT STOCK—*continued.*

SECTION	Brought forward,	£32	£871
36. Best Ox, of any other Pure or Cross Breed calved after 1st Jan. 1874,		6	
Second best,		3	
37. Best Ditto, calved after 1st Jan. 1875,		5	
Second best,		2	
38. Best Cross-bred Heifer, calved after 1st Jan. 1874,		6	
Second best,		3	
39. Best Cross-bred Heifer, calved after 1st Jan. 1875,		5	
Second best,		2	
		64	
			£935

CLASS II.—HORSES

FOR AGRICULTURAL PURPOSES.

1. Best Stallion foaled before 1st Jan. 1874,	£40
Second best,	30
Third best,	20
Fourth best,	10
Breeder of best Stallion, The Silver Medal.	
2. Best Entire Colt foaled after 1st Jan. 1874,	30
Second best,	20
Third best,	10
Fourth best,	5
3. Best Entire Colt foaled after 1st Jan. 1875,	20
Second best,	14
Third best,	7
Fourth best,	4
4. Best Entire Colt foaled after 1st Jan. 1876,	15
Second best,	8
Third best,	4
Fourth best,	2
5. Best Mare (with Foal at foot) foaled before 1st Jan. 1874,	30
Second best,	20
Third best,	15
Fourth best,	6
6. Best Mare (in Foal) foaled before 1st Jan. 1874,	25
Second best,	15
Third best,	10
Fourth best,	5
7. Best Filly foaled after 1st Jan. 1874,	20
Second best,	10
Third best,	5
Fourth best,	3
	£403
	Carry forward,

HORSES FOR AGRICULTURAL PURPOSES—*continued*.

SECTION	Brought forward,	£403
8. Best Filly foaled after 1st Jan. 1875,		15
Second best,		8
Third best,		4
Fourth best,		2
9. Best Filly foaled after 1st Jan. 1876,		10
Second best,		5
Third best,		3
Fourth best,		2
10. Best Draught Gelding foaled before 1st Jan. 1874,		10
Second best,		5
Third best,		3
11. Best Draught Gelding, foaled after 1st Jan. 1874,		8
Second best,		4
Third best,		2
		<hr/>
		£484

HUNTERS AND ROADSTERS.

12. Best Brood Mare, with Foal at foot, suitable for Field,	£20
Second best,	10
Third best,	5
13. Best Yeld Mare or Gelding, suitable for Field, heavy weight, foaled before 1st Jan. 1873,	20
Second best,	10
Third best,	5
14. Best Yeld Mare or Gelding, suitable for Field, light weight, before 1st Jan. 1873,	20
Second best,	10
Third best,	5
15. Best Mare or Gelding, suitable for Field, foaled after 1st Jan. 1873,	15
Second best,	8
Third best,	4
16. Best Mare or Gelding, suitable for Field, foaled after 1st Jan. 1874,	10
Second best,	5
Third best,	3
17. Best Mare or Gelding, suitable for Carriage, foaled before 1st Jan. 1873,	20
Second best,	10
Third best,	5
18. Best Mare or Gelding, suitable as Hackney or Roadster, between 14 and 15 hands high,	8
Second best,	4
Third best,	2
	<hr/>
Carry forward,	199
	<hr/>
	£484

HUNTERS AND ROADSTERS—*continued.*

SECTION	Brought forward,	£199'	£484
19. Best Stallion, Mare, or Gelding, for leaping, .		10	
Second best,		5	
Third best,		3	
		<hr/>	217

PONIES.

20. Best Highland Stallion, 14½ hands and under, .	6	
Second best,	3	
Third best,	1	
21. Best Highland Mare or Gelding, between 13 and 14½ hands high,	6	
Second best,	3	
Third best,	1	
22. Best Mare or Gelding, between 12½ and 14 hands high,	6	
Second best,	3	
Third best,	1	
23. Best Mare or Gelding, under 12½ hands high, .	6	
Second best,	3	
Third best,	1	
	<hr/>	40

THOROUGH-BRED STALLIONS.

Best Thorough-bred Stallion to serve in the District of the Show in season 1877,	50
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	£791

CLASS III.—SHEEP.

CHEVIOT.

1. Best Tup, three shear and upwards,	£12
Second best,	8
Third best,	4
2. Best Tup, two shear,	12
Second best,	8
Third best,	4
3. Best Shearling Tup,	12
Second best,	8
Third best,	4
4. Best 5 Ewes above one shear,	10
Second best,	5
Third best,	2
Best Pen of Lambs shown with Ewes,	2
Second best,	1
	<hr/>
Carry Forward,	£92

CHEVIOT—*continued.*

SECTION	Brought forward,	£92
5. Best 5 Shearling Ewes or Gimmers,		10
Second best,		5
Third best,		2
		<hr/>
		109

BLACKFACED.

6. Best Tup, three shear and upwards	12
Second best,	8
Third best,	4
7. Best Tup, two shear,	12
Second best,	8
Third best,	4
8. Best Shearling Tup,	12
Second best,	8
Third best,	4
9. Best 5 Ewes above one shear,	10
Second best,	5
Third best,	2
Best Pen of Lambs shown with Ewes,	2
Second best,	1
10. Best 5 Shearling Ewes or Gimmers,	10
Second best,	5
Third best,	2
	<hr/>
	109

BORDER LEICESTER.

11. Best Tup above one shear,	12
Second best,	8
Third best,	4
12. Best Shearling Tup,	12
Second best,	8
Third best,	4
13. Best 5 Ewes above one shear,	10
Second best,	5
Third best,	2
14. Best 5 Shearling Ewes, or Gimmers,	10
Second best,	5
Third best,	2
	<hr/>
	82

LEICESTER.

15. Best Tup of any age,	8
Second best,	4
Third best,	2
16. Best 5 Ewes of any age, or Gimmers,	6
Second best,	3
Third best,	1
	<hr/>
	24
	<hr/>
Carry forward,	£124

SECTION	Brought forward,	£324
COTSWOLD.		
17. Best Tup of any age,	£8	
Second best,	4	
Third best,	2	
18. Best 5 Ewes of any age, or Gimmers,	6	
Second best,	3	
Third best,	1	
	—	24
LINCOLN.		
19. Best Tup of any age,	8	
Second best,	4	
Third best,	2	
20. Best 5 Ewes of any age, or Gimmers,	6	
Second best,	3	
Third best,	1	
	—	24
SOUTHDOWN.		
21. Best Tup of any age,	8	
Second best,	4	
Third best,	2	
22. Best 5 Ewes of any age, or Gimmers,	6	
Second best,	3	
Third best,	1	
	—	24
SHROPSHIRE.		
23. Best Tup of any age,	8	
Second best,	4	
Third best,	2	
24. Best 5 Ewes of any age, or Gimmers,	6	
Second best,	3	
Third best,	1	
	—	24
EXTRA SHEEP.		
25. Best 5 Cheviot Wethers, not above 3 shear,	4	
Second best,	2	
26. Best 5 Blackfaced Wethers, not above 4 shear,	4	
Second best,	2	
27. Best 5 Wether Hogs of any cross, not above 4 shear,	4	
Second best,	2	
	—	18
		—
		548

CLASS IV.—WOOL.

SECTION

1. Best Woolled Tup, Cheviot Breed,	£5
2. Best Woolled Tup, Blackfaced Breed,	5
3. Best Woolled Tup, Leicester Breed, †	5
	<hr/>
	£15

CLASS V.—SWINE.

LARGE BREED.

1. Best Boar,	£8
Second best,	4
Third best,	2
2. Best Sow,	6
Second best,	3
Third best,	1
3. Best Pen of 3 Pigs, not above 8 months old,	4
Second best,	2
Third best,	1
	<hr/>
	£31

BLACK OR BERKSHIRE.

4. Best Boar,	£8
Second best,	4
Third best,	2
5. Best Sow,	6
Second best,	3
Third best,	1
6. Best Pen of 3 Pigs, not above 8 months old,	4
Second best,	2
Third best,	1
	<hr/>
	31

SMALL BREED.

7. Best Boar,	8
Second best,	4
Third best,	2
8. Best Sow,	6
Second best,	3
Third best,	1
9. Best Pen of 3 Pigs, not above 8 months old,	4
Second best,	2
Third best,	1
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	31
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	£93

EXTRA STOCK.

Animals not included in the Sections for Competition may be exhibited as Extra Stock, and will receive Honorary Premiums when specially commended.

CLASS VI.—POULTRY.

FIRST PREMIUM—ONE SOVEREIGN; SECOND PREMIUM—TEN SHILLINGS
—in all the Sections of Poultry.

Aged Birds must have been hatched previous to, and Cockerels and Pullets in, 1877.

	<i>Section</i>	<i>Section</i>
DORKING— <i>Silver Grey</i> , . . .	1. Cock.	2. 2 Hens.
	3. Cockerel.	4. 2 Pullets.
DORKING— <i>Coloured</i> , . . .	5. Cock.	6. 2 Hens.
	7. Cockerel.	8. 2 Pullets.
COCHIN-CHINA, . . .	9. Cock.	10. 2 Hens.
	11. Cockerel.	12. 2 Pullets.
BRAHMAPOOTRA, . . .	13. Cock.	14. 2 Hens.
	15. Cockerel.	16. 2 Pullets.
SPANISH, . . .	17. Cock.	18. 2 Hens.
	19. Cockerel.	20. 2 Pullets.
SCOTCH GREY, . . .	21. Cock.	22. 2 Hens.
	23. Cockerel.	24. 2 Pullets.
HAMBURG— <i>Pencilled</i> , . . .	25. Cock.	26. 2 Hens.
	27. Cockerel.	28. 2 Pullets.
HAMBURG— <i>Spangled</i> , . . .	29. Cock.	30. 2 Hens.
	31. Cockerel.	32. 2 Pullets.
POLISH, . . .	33. Cock.	34. 2 Hens.
	35. Cockerel.	36. 2 Pullets.
GAME— <i>Black or Brown</i> {	37. Cock.	38. 1 Hen.
<i>Reds</i> , . . . {	39. Cockerel.	40. 1 Pullet.
GAME— <i>Duckwings</i> , or {	41. Cock.	42. 1 Hen.
<i>any other variety</i> , . . . {	43. Cockerel.	44. 1 Pullet.
BANTAMS— <i>Game</i> , . . .	45. Cock.	46. 1 Hen.
	47. Cockerel.	48. 1 Pullet.
BANTAMS— <i>Sebright</i> , . . .	49. Cock.	50. 2 Hens.
	51. Cockerel.	52. 2 Pullets.
BANTAMS— <i>Any other</i> {	53. Cock.	54. 2 Hens.
<i>Variety</i> , . . . {	55. Cockerel.	56. 2 Pullets.
ANY OTHER PURE BREED {	57. Cock.	58. 2 Hens.
OF POULTRY, . . . {	59. Cockerel.	60. 2 Pullets.
DUCKS— <i>White Aylesbury</i> , . . .	61. Drake.	62. 1 Duck.
	63. Drake (Young).	64. 1 Duckling.
DUCKS— <i>Rouen</i> , . . .	65. Drake.	66. 1 Duck.
	67. Drake (Young).	68. 1 Duckling.
DUCKS— <i>Any other Pure</i> {	69. Drake.	70. 1 Duck.
<i>Breed</i> , . . . {	71. Drake (Young).	72. 1 Duckling.
TURKEYS— <i>Black Norfolk</i> , . . .	73. Cock.	74. 1 Hen.
	75. Cock (Poult).	76. 1 Hen (Poult).
TURKEYS— <i>Any other Breed</i> , . . .	77. Cock.	78. 1 Hen.
	79. Cock (Poult).	80. 1 Hen (Poult).
GEESE— <i>Grey Toulouse</i> , . . .	81. Gander.	82. 1 Goose.
	83. Gander (Young).	84. 1 Gosling.

POULTRY—*continued.*

	<i>Section.</i>	<i>Section.</i>
GEESE— <i>Embden,</i>	85. Gander.	86. 1 Goose.
	87. Gander (Young).	88. 1 Gosling.
GEESE— <i>Any other Pure</i> {	89. Gander.	90. 1 Goose.
<i>Breed,</i>	91. Gander (Young).	92. 1 Gosling.

Total amount of Poultry Premiums, £138.

CLASS VII.—IMPLEMENTS, &c.

Reference is made to the General Regulations for the terms on which Implements and Machines may be exhibited, and the conditions under which New Inventions and Improvements will be tried and rewarded.

ABSTRACT OF PREMIUMS.

1. Cattle,	£935	0	0
2. Horses,	791	0	0
3. Sheep,	438	0	0
4. Wool,	15	0	0
5. Swine,	93	0	0
6. Poultry,	138	0	0
7. Medium Gold Medals to former Prize Animals, say	180	0	0
8. Six Silver Medals to Breeders of best Aged Bulls and best Stallion,	4	16	0
9. Extra Stock, say	40	0	0
10. Implements, say	80	0	0
	£2714	16	0

GENERAL SHOW OF STOCK AND IMPLEMENTS At DUMFRIES, 1878.

The District connected with the Show comprises Dumfriesshire,
Stewartry of Kirkcudbright and Wigtownshire.

Premiums will be offered for the following Classes :—

CATTLE.

GALLOWAY.

Bulls calved before 1st January.....	1876
Bulls calved after 1st January	1876
Bulls calved after 1st January	1877
Cows calved before 1st January	1875
Cows calved after 1st January	1875
Heifers calved after 1st January	1876
Heifers calved after 1st January	1877

POLLED ANGUS OR ABERDEEN.

Bulls calved before 1st January.....	1876
Bulls calved after 1st January	1876
Bulls calved after 1st January	1877
Cows of any age.	
Heifers calved after 1st January	1876
Heifers calved after 1st January	1877

SHORTHORN.

Bulls calved before 1st January.....	1876
Bulls calved after 1st January	1876
Bulls calved after 1st January	1877
Cows of any age.	
Heifers calved after 1st January	1876
Heifers calved after 1st January	1877

AYRSHIRE.

Bulls calved before 1st January.....	1876
Bulls calved after 1st January	1876
Bulls calved after 1st January	1877
Cows in milk calved before 1st January	1875
Cows in milk calved after 1st January.....	1875
Cows in calf of any age, or Heifers in calf calved before 1st January	1876
Heifers calved after 1st January	1876
Heifers calved after 1st January	1877

HIGHLAND.

Bulls calved before 1st January	1876
Bulls calved after 1st January	1876
Cows of any age.	
Heifers calved after 1st January	1875
Heifers calved after 1st January	1876

FAT STOCK.

Galloway Oxen calved after 1st January	1875
Galloway Oxen calved after 1st January	1876
Highland Oxen calved after 1st January	1874
Highland Oxen calved after 1st January	1875
Oxen of any other pure or cross breed calved after 1st January	1875
Oxen of any other pure or cross breed calved after 1st January	1876
Galloway Heifers calved after 1st January	1875
Galloway Heifers calved after 1st January	1876
Cross-bred Heifers calved after 1st January.....	1875

HORSES

For Agricultural Purposes.

Stallions foaled before 1st January.....	1875
Entire Colts foaled after 1st January	1875
Entire Colts foaled after 1st January	1876
Entire Colts foaled after 1st January	1877
Mares with foals at foot, foaled before 1st January	1875
Mares in foal, foaled before 1st January	1875
Fillies foaled after 1st January.....	1875
Fillies foaled after 1st January.....	1876
Fillies foaled after 1st January.....	1877
Draught Geldings foaled before 1st January	1875
Draught Geldings foaled after 1st January	1875

THOROUGH-BRED STALLIONS.

Thorough-bred Stallions to serve in the District of the Show in Season 1878. To be shown at Dumfries in Spring 1878.

HUNTERS AND ROADSTERS.

Brood Mares, with foals at foot, suitable for field.
 Mares or Geldings, suitable for field, foaled before 1st January 1874
 Mares or Geldings, suitable for field, foaled before 1st January...1875
 Mares or Geldings, suitable as Hackneys or Roadsters, between
 14 and 15 hands high.
 Stallions, Mares, or Geldings, for leaping.

PONIES.

Highland Stallions 14½ hands and under.
 Highland Mares or Geldings between 13 and 14½ hands high.
 Mares or Geldings between 12½ and 14 hands high.
 Mares or Geldings under 12½ hands.

S H E E P.

Ewes, Gimmers, Wethers, and Hoggs to be exhibited in pens of five.

CHEVIOT.

Tups three shear and upwards.
Tups two shear.
Shearling Tups.
Ewes above one shear.
Shearling Ewes or Gimmers.

BLACKFACED.

Tups three shear and upwards,
Tups two shear.
Shearling Tups.
Ewes above one shear.
Shearling Ewes or Gimmers.

BORDER LEICESTER.

Tups above one shear.
Shearling Tups.
Ewes above one shear.
Shearling Ewes or Gimmers

LEICESTER.

Tups above one shear.
Shearling Tups.
Ewes above one shear.
Shearling Ewes or Gimmers.

COTSWOLD.

Tups above one shear.
Shearling Tups.
Ewes above one shear.
Shearling Ewes or Gimmers.

LINCOLN.

Tups above one shear.
Shearling Tups.
Ewes above one shear.
Shearling Ewes or Gimmers.

SOUTHDOWN.

Tups above one shear.
Shearling Tups.
Ewes above one shear.
Shearling Ewes or Gimmers.

SHROPSHIRE.

Tups above one shear.
Shearling Tups.
Ewes above one shear.
Shearling Ewes or Gimmers.

EXTRA SHEEP.

Cheviot Wethers not above three shear.
Blackfaced Wethers not above four shear.
Half-bred Wether Hoggs not above one shear.
Cross-bred Wether Hoggs not above one shear.

Sheep not included in the above Classes must be entered as Extra Stock.

WOOL.

Best Woolled Tups of the Cheviot, Blackfaced, Leicester, and any other Long Woolled Breeds.

SWINE.

Pigs to be exhibited in pens of three.

LARGE BREED.

Boars.

Sows.

Pigs not above 8 months old.

BLACK OR BERKSHIRE.

Boars.

Sows.

Pigs not above 8 months old.

SMALL BREED.

Boars.

Sows.

Pigs not above 8 months old.

POULTRY.

To be shown in Pens of One Cock or Cockerel and Two Hens or Pullets of each of the following breeds, except in the sections for Ducks, Turkeys, Geese, and Hens and Pullets of the Game and Malay Breeds, where only one bird is required:—

Dorking—Silver-Grey.

Dorking—Coloured.

Cochin-China.

Brahmapootra.

Spanish.

Scotch Grey.

Hamburg—Pencilled.

Hamburg—Spangled.

Polish.

Game—Black or Brown Reds.

Game—Duckwings, or any other variety.

Bantams—Game.

Bantams—Sebright.

Bantams—Any other variety.

Any other pure Breed of Poultry.

Ducks—White Aylesbury.

Ducks—Rouen.

Ducks—Any other pure Breed.

Turkeys—Black Norfolk.

Turkeys—Any other Breed.

Geese—Grey Toulouse.

Geese—Emden.

Geese—Any other pure Breed.

DAIRY PRODUCE.

Cured Butter, not less than 7 lbs.

Powdered Butter, do.

Fresh Butter, three $\frac{1}{2}$ -lb. rolls.

Cheddar Cheese, 56 lbs. and upwards.

Cheddar Cheese, 14 lbs. and under.

Dunlop Cheese, 30 lbs. and upwards.

Cheese of any other variety, 30 lbs. and upwards.

Cheese, flat make, any variety, 15 lbs. and under.

F. N. MENZIES, *Secretary.*

APPENDIX (C.)

LIST OF MEMBERS

OF

THE HIGHLAND AND AGRICULTURAL
SOCIETY OF SCOTLAND,

1877,

ALPHABETICALLY ARRANGED, AND DISTINGUISHING
THE YEAR OF ADMISSION.

By the Charter of 1834 the Society consists of two classes, Ordinary and Honorary or Corresponding Members. The number of Honorary or Corresponding Members resident in the United Kingdom must not exceed twenty, but with power to the Society to elect as Honorary Associates persons resident abroad, not subjects of Her Majesty, who may have been benefactors to the Society, or who are distinguished for their skill in Art or Science, provided that the number of such Foreign Associates shall not exceed twenty.

By a Bye-Law passed in 1873, with reference to the Supplementary Charter of 1856, successful Candidates for the Society's Agricultural Diploma are thereby eligible to be elected free Life Members of the Society.

Candidates for ordinary Membership must be proposed by a Member, and are elected at the half-yearly General Meetings in January and June. It is not necessary that the Member who proposes the Candidate should attend the Meeting.

The ordinary subscription is £1, 3s. 6d. annually, which may be redeemed by one payment, varying, according to the number of previous annual payments, from £12, 12s. to £7, 1s. Proprietors farming the whole of their own lands, whose assessment on the Valuation Roll does not exceed £500 per annum, and all Tenant-Farmers, Office-Bearers of Local Agricultural Associations, Resident Agricultural Factors, Land Stewards, Foresters, Agricultural Implement Makers, and Veterinary Surgeons, none of them being also owners of land to an extent exceeding £500 per annum, are admitted on a subscription of 10s. annually, which may be redeemed by one payment, varying, according to the number of previous annual payments, from £5, 5s. to £3.

According to the Charter, a Member who homologates his Election by paying his first subscription cannot retire until he has paid, in annual subscriptions, or otherwise, an amount equivalent to a life composition.

Members of the Society receive the Transactions on application, and are entitled to apply for District Premiums—to report Ploughing Matches for the Medal—to attend Shows free of charge, and to exhibit Stock at reduced rates.

Members having Candidates to propose are requested to send their names to FLETCHER NORTON MENZIES, Esq., No. 3 George IV. Bridge, Edinburgh.

The Members marked * have been Presidents; and † Vice-Presidents.

LIST OF MEMBERS.

Her Most Gracious Majesty THE QUEEN.

*His Royal Highness The PRINCE OF WALES.

Admitted

1872

1873

<p>Admitted 1833 ABERCORN, His Grace the Duke of, K.G., Chesterfield House, London 1862 ABERCROMBY, Right Hon. Lord, Airthrey Castle, Stirling 1873 ABERCROMBY, Sir Robert John, of Birkenbog, Bart., Forglen, Turrieff 1868† ABERDEEN, Right Hon. the Earl of, Haddo House, Methlic 1872 Abernethy, Peter, Halls, Penicuik 1865 ABINGER, Right Hon. Lord, Inverlochry Castle, Kingussie 1859 Adam, Alex. F., W.S., 19 Claremont Crescent, Edinburgh 1855 Adam, Aeneas, Hambertson, Dingwall 1842 Adam, James, S.S.C., 19 Claremont Crescent, Edinburgh 1860 Adam, John, Closeburn, Thornhill 1856 Adam, Stephen, Wool-Merchant, 11 Hillside Crescent, Edinburgh 1876 Adam, Thomas, National Bank, Aberdeen 1876 Adam, Thomas, junr. (Adam & Co., Shipowners), Aberdeen 1874 Adam, Thomas, of Lynegar, Bank Agent, Wick 1876 Adam, William, Bush, Banchory-Terrace 1830 Adam, William, Advocate, Aberdeen 1853 ADAM, Right Hon. W. Patrick, of Blair-Adam, M.P. 1872 Adamson, Henry D., Balquharn, Alford 1859 Adamson, S., of Drumelyre, Dumfries 1874 Addie, Gavin, Viewpark, Uddingston 1875 Addie, John, Viewpark, Uddingston 1859 Adie, Alexander James, Lindlithgow 1850 AGNEW, Sir Andrew, of Lochnaw, Bart., Stranraer 1843 Agnew, R. Vane, of Shenchan and Barnbarroch, M.P., Wigtown 1875 Agnew, William, Balwherrrie, Stranraer 1857 Aikman, Thomson, Glasgow 1876 Ainslie, Ainslie Douglas, of Delgaty Castle, Turrieff</p>	<p>Admitted 1864 Ainslie, Daniel (of the Gart, Callander), 48 Moray Place, Edinburgh 1859 Ainslie, David, of Costerton, Blackshields 1848 Ainslie, J., Hillend, Pentland, Loanhead 1853 Ainslie, R., of Elvingston, Gladsmuir 1875 Ainslie, William, Stobo Mill, Stobo 1852† AINSLIE, Right Hon. the Earl of, K.T., Cortachy Castle, Kirriemuir 1874 Aitchison, James, 23 Princes Street, Edinburgh 1851 Aitchison, James (date Proney Mains, Dornoch), Australia 1865 Aitchison, Lieut.-Col., of Drummore, Musselburgh 1870 Aitchison, Peter, West Garleton, Haddington 1863 Aitchison, William, Linhope, Hawick 1861 Aitken, George, Tyrie, Kirkeabdy 1857 Aitken, James, 2 Claremont Terrace, Glasgow 1876 Aitken, James, of Auchengillan, Strathblane 1854 Aitken, James, Markle, Prestonkirk 1864 Aitken, John Gillespie, Southfield, Stirling 1857 Aitken, Robt., Drumore, Campbeltown 1869 Aitken, Robert, Kilmarny, Cupar Fife 1860 Aitken, Thomas, 5 Grosvenor Crescent, Edinburgh 1854 Aitken, Thomas, Edinshields, Balerno 1875 Aitkenhead, Alex., Shawmoss, Pollokshaws 1870 Alexander, Archd., Merchant, West Linton 1872 Alexander, Charles, Easter Knowe, Stobo 1856 Alexander, C., Whitfield, West Linton 1861 Alexander, Lt.-Col. C., of Ballochmyle, M.P., Mauchline 1872 Alexander, George, Easter Lilliesleaf, St Boswells</p>
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Admitted

- 1876 Alexander, George, South Balnoon, Huntly
 1831 ALEXANDER, Sir J. Edward, C.B., of Westerton, Bridge of Allan
 1857 Alexander, James, Seed Merchant, 1 Waterloo Place, Edinburgh
 1870 Alexander, James, of Balmule, Dunfermline
 1875 Alexander, James, 60 North Street, Glasgow
 1855 Alexander, John, Broughty Ferry
 1872 Alexander, John, Broxburn Hall, Broxburn
 1876 Alexander, John, Solicitor, Lanark
 1861 Alexander, Thomas, Corn Factor, Perth
 1858 Alexander, Wm., Bent of Haulkerton, Laurencekirk
 1873 Alexander, William, Loanside, Clackmannan
 1865 Alison, James M., Redcastle, Inverness
 1833 Allan, Alexander, Advocate, 5 Hillside Crescent, Edinburgh
 1861 Allan, Alex., Kinnon Park, Methven, Perth
 1864 Allan, Alexander, Carbarns, Wishaw
 1867 Allan, Andrew, Munnoch, Dalry, Ayr
 1847 Allan, Lieut.-Colonel, Edinburgh
 1874 Allan, James, Corn Merchant, Borrowstounness
 1875 Allan, James, jun., Borrowstounness
 1851 Allan, James, Gogar Mains, Corstonphine
 1855 Allan, James, Clauchlands, Lamlash
 1870 Allan, Jas., jun., Balnacole, Brodick, Arran
 1852 Allan, James, West Mains, Stonehouse
 1863 Allan, James D., Culhill, Dunkeld
 1854 Allan, John, Billie Mains, Ayton
 1861 Allan, John, Crieffvechter, Crieff
 1873 Allan, John, Redheugh, Cockburnspath
 1863 Allan, Richard, Howden, Jedburgh
 1875 Allan, Robert, Glenmore, Kilmelford, Lochgilphead
 1863 Allan, Robert A., Eyemouth
 1852 Allan, T. W. Murray, of Glenfeochan, Oban
 1874 Allan, William, Clury, Grantown
 1870 Allan, William, Drummondreoch, Ferintosh
 1871 Allan, William, Park, Clackmannan
 1830 Allan, William, Edinburgh
 1873 Alston, David, Hyndford Wells, West Linton
 1864 Alston, Geo., of Craighead, Hamilton
 1850 Alston, John P., of Muirburn, Strathaven

Admitted

- 1838 ANDERSON, Sir Alexander, Aberdeen
 1874 Anderson, Alexander, Berryhill, Dundee
 1866 Anderson, B. T. G., of Tushielaw, Selkirk
 1873 Anderson, Arthur, M.D., C.B., Sunnybrae, Pitlochry
 1877 Anderson, Charles, jun., North British Agriculturist, 377 High Street, Edinburgh
 1875 Anderson, Charles, Fettykil, Leslie
 1825 Anderson, D., of Moredun, 24 Moray Place, Edinburgh
 1872 Anderson, Findlay, of Inchyra Grange, Polmont
 1862 Anderson, Geo., of Woodhouse, Ecclefechan
 1863 Anderson, George, of Hawthorn Bank, Selkirk
 1859 Anderson, George B., Meikle Pinkerton, Dunbar
 1857 Anderson, Henry, of Chapel, Kirkcaldy
 1861 Anderson, Henry, Burnside, Stanley
 1873 Anderson, James, Feorline, Strachur, Inveraray
 1839 Anderson, J., late of Gorthlick, Inverness
 1863 Anderson, James, Newbigging, Dundee
 1865 Anderson, James, Solicitor, Inverness
 1871 Anderson, John, Airies, Kirkinner
 1873 Anderson, John, Chapel, Moffat
 1838 Anderson, John, Merchant, London
 1838 Anderson, John, Merchant, Glasgow
 1857 Anderson, John, Craigton, Banchory
 1868 Anderson, John, Mill of Wester Coull Tarland
 1857 Anderson, John, 14 Dean Terrace, Edinburgh
 1859 Anderson, John, Smithstown, Croy, Kilsyth
 1873 Anderson, John, Strachermore, Inveraray
 1871 Anderson, John A., St Albans, Perth
 1876 Anderson, John M., Burngrains, Ellon
 1870 Anderson, John S. (of Whiteside, Dumfries), Dalhousie Mains, Dalkeith
 1851 Anderson, Lawrence, Northfield Cottage, Liberton
 1864 Anderson, Peter, Gillespie, Glenluce
 1870 Anderson, Robert, Alleyford, Kirkgunzeon, Dumfries
 1856 Anderson, Robert, of Lochdhu, Nairn
 1871 Anderson, Robert, Middlebank, Errol

Admitted

- 1861 Anderson, Robt. H., Burleigh, Milnathort
 1850 Anderson, Robert Hood, Glasgow
 1877 Anderson, Robert John, Cattle Salesman, Ashgrove, Aberdeen
 1876 Anderson, R. Lang, Milliken Park, Renfrewshire—*Free Life Member*
 1858 Anderson, Robt. Wm., Clerk of Supply, Forfar
 1849 Anderson, Stephen, Bridge of Allan
 1832 Anderson, Thomas, of Glendrisaig, Lainshaw House, Kilmarnock
 1854 Anderson, T. Scott, W.S., 10 Norfolk Crescent, Hyde Park, London, W.
 1865 Anderson, William, Ballimore, Tighna-bruiach
 1867 Anderson, W. H., Clifton Villa, Anstruther
 1877 Anderson, William, Barneil, Kirkmichael, Maybole
 1857 Anderson, William, Hattonburn, Banchoy
 1873 Anderson, William, Norton Mains, Ratho
 1870 Anderson, William, Café Royal Hotel, Edinburgh
 1876 Anderson, William, Wardes, Kintore
 1876 Anderson, William, Wellhouse, Alford
 1840 Anderson, William James, late of Technuiry
 1857 Andrew, Hugh, Keprigan, Campbelltown
 1873 Andrew, Robert, Allans, Inchinnan, Paisley
 1870 Andrew, William J., Banker, Coatbridge
 1875 Andrews, John, Land Steward, Melville, Ladybank
 1863 Angus, John, Whitefield, Morpeth
 1871 Annan, David, The Torr, Moonzie, Cupar Fife
 1868 Annand, John, Hotel, Inverurie
 1872 ANSTRUTHER, Sir W. C. J. C., of Anstruther, Bart., M.P., Carnichael House, Thankerton
 1862 ANSTRUTHER, Sir Robert, of Balcaskie, Bart., M.P., Pittenweem
 1858 Anton, James, Seafield, Forres
 1833 ARBUTHNOTT, Right Hon. Viscount, Arbuthnot House, Fordoun
 1864 ARBUTHNOTT, Hon. Mrs., Inchmartine
 1873 ARBUTHNOTT, Hon. The Master of, Arbuthnot House, Fordoun
 1855 Archibald, Thomas, of Viewbank, Lasswade
 1864 Archer, Thos., late Ramly Lodge, Lymington, Hants
 1876 Archibald, T. B., Nisbettfield, Ladybank
 1869 Archibald, James, Glengelt, Lander

Admitted

- 1861 Archibald, James, Jamestown House, Monasterevan, Co. Kildare Ireland
 1849 Archibald, John, Cockburn, Dunse
 1869 Archibald, John, jun., Duddingston, South Queensferry
 1844* ARGYLL, His Grace the Duke of, K.T., Inveraray Castle, Inveraray
 1853 Arklay, John, late Gorthlick, Inverness
 1861 Arklay, Robert, of Ethiebeaton, Dundee
 1850 Arkley, R. H., Dun House, Montrose
 1875 Armstrong, Thomas, 175 Craighall Road, Glasgow
 1862 Arnot, David, Friarton, Newport, Fife
 1871 Arnot, William, Glamis Mains, Glamis
 1865 Arnot, Thomas R., Ramshill, Harlesden Green, London
 1862 Arras, Walter, Fodderty, Dingwall
 1874 Arres, James Mather, Arderseir Mains, Arderseir
 1865 Arres, Wm., Dell, Kingussie
 1858 Arundell, W. F. H., of Barjarg, Dumfries
 1873 Ashdown, A. H., Uppington, Salop—*Free Life Member*
 1874 Asher, William G. C., Belmaduthy, Munlochay
 1845 Askew, Henry Wm., late Conishead Priory, Ulverston
 1863 Askew, W., of Pallinsburn, Coldstream
 1860 ATHOLE, His Grace the Duke of, K.T., Blair Castle, Blair Athole
 1841 ATHOLE, Her Grace the Duchess-Dowager of, Dunkeld
 1874 Auld, Alexander, Newton, Rothmaise, Inch
 1851 Austin, R. S., late Middleton, Muthill
 1873 AVELAND, Right Hon. Lord, Normanston Park, Oakham, Rutlandshire
 1875 Aveling, Thomas, Rochester, Kent
 1849 Aytoun, James, Advocate, London
 1841 Aytoun, Roger S., of Inchdairnie, Kirkealdy
 1831 BAILLIE, Hon. Charles, 10 Strathearn Road, Edinburgh
 1824 Baillie, Evan, of Dochfour, Inverness
 1839 BAILLIE, Right Hon. Henry James, of Rodeastle, Kilmarnock, Inverness
 1851 Baillie, James William, of Culterallers, W.S., Biggar
 1865 Baillie, John Menzies, C.A., 15 Northumberland Street, Edinburgh
 1869 Baillie, John, Fullerton, Penicuik
 1865 Baillie, John B., of Leys, Inverness
 1847 BAILLIE, Sir William, of Polkemmet Bart., Whitburn
 1875 Bain, Daniel, Pinstaffnage, Oban

Admitted	Admitted
1875 BAIN, Hon. James, Lord Provost of Glasgow	1858 Barclay, Charles A., Aberdour House, Fraserburgh
1864 Bain, James, Banker, St Andrews	1855 Barclay, George, Davochbeg, Golspie
1875 Bain, Sam. F., Inch of Leckie, Gargunnoch	1858 Barclay, George, Yonderton, Turriff
1876 Bain, William, Horse-hirer, Aberdeen	1834 Barclay, George Robertson, late of Keavil, Dunfermline
1873 Baird, Alex., of Urie, Stonehaven	1862 Barclay, J. W., M.P., 60 Dee Street, Aberdeen
1868 Baird, Arthur E., Croftonloan, Pitlochry	1859 Barclay, Robert, Drums, Falkland
1876 Baird, Colin C., V.S., Veterinary College, Clyde Street, Edinburgh	1855 Barclay, Thomas, Solicitor, Montrose
1860 BAIRD, Sir David, of Newbyth, Bart., Prestonkirk	1865 Barclay, Thomas, Skelbo, Dornoch
1875 Baird, Hugh, junr., 17 Westbourne Gardens, Glasgow	1874 Barclay-Allardice, Robert, University Club, Edinburgh
1876 Baird, James, Crosshill, Rutherglen	1839 Barker, Thomas, Sydney, Australia
1843 BAIRD, Sir Jas. Gardiner, of Saughton Hall, Bart., Inch House, Liberton	1862 Barr, James, jun., Whiteshaw, Carlisle
1870 Baird, John Hall, Kirkconnel, Sanquhar	1875 Barr, William, Kerrylamont, Rothesay
1870 Baird, John, Solicitor, Lockerbie	1863 Barrie, James, Harden Mains, Jedburgh
1871 Baird, John, jun., Solicitor, Lockerbie	1846 Barstow, Charles M., C.A., 32 India Street, Edinburgh
1873 Baird, Thomas, Hundleshope, Peebles	1867 Bartholomew, Hugh, of Glenorchard, Baldernock
1873 Baird, Wm., of Elie, Fife	1855 Bartholomew, Jas., Duntarvie, Winchburgh
1873 BALFOUR of Burleigh, Right Hon. Lord, Kennet House, Clackmannan	1875 Bartlemore, Robert, Netherhouses, Lochwinnoch
1863 Balfour, Arthur J., of Whittinghame, M.P., Prestonkirk	1873 Barty, James W., Procurator-Fiscal, Dunblane
1843 Balfour, Colonel David, of Balfour and Trenabie, Kirkwall	1871 Bate, John, of Broadchapel, Lochmaben
1857 Balfour, Major Francis W., of Fernie Castle, Ladybank	1865 Bateson, Sam. S., 17 Bolton Street, London
1839 Balfour, John, of Balbirnie, Markinch	1861 Bathgate, James, Ormiston, Tranent
1839 Balfour, John Hutton, M.D., Prof. of Botany, University of Edinburgh	1877 Bathie, William, Auctioneer, Arbroath
1869 Balfour, John M., of Pilrig, W.S., Edinburgh	1873 Bauchope, Thomas, Land Surveyor, East Brucefield, West Calder
1873 Balfour, Cap. Robt. Fred., younger of Balbirnie, Markinch	1877 Baxter, David, Ladyburn, Maybole
1860 Ballantyne, John, jun., Seedsman, Dalkeith	1854 Baxter, Edmund, W.S., 9 Rutland Square, Edinburgh
1869 Ballantyne, Thomas, Netherton, East Kilbride	1875 Bayley, George, of Manuel, 13 Regent Terrace, Edinburgh
1870 Ballingal, And. H., W.S., Perth	1864 Bayne, John, Builder, Bridge of Allan
1871 Ballingal, Neil, Sweetbank, Markinch	1869 Bayne, Lewis, Kimmel Park, Abergele
1859 Ballingal, William, Sweetbank, Markinch	1876 Bean, Alex., Netherthlird, Rothie
1857 Ballingall, D., Factor, Blairdrummond	1876 Bean, George, Balquhain, Inverurie
1860 Ballingall, George, Clarilaw, St Boswells	1876 Bean, William, Newton, Cairnie, Huntly
1861 Ballingall, John, Dunbog, Newburgh	1868 Beath, David, Auchmuir, Leslie
1863 Balmer, Thomas, Fochabers	1872 Beattie, Adam, Builder, 15 Grosvenor Street, Edinburgh
1862 Bankes, Meyrick, of Letterewe, Dingwall	1854 Beattie, James, Newbie House, Annan
1858 BANNERMAN, Sir Alex., of Crimonmogate, Bart., Lomnay	1870 Beattie, Jn., Bulmansknowe, Canonbie
1859 Barbour, G. F. (of Bonskeid, Pitlochry), 11 George Square, Edinburgh	1877 Beattie, Simon, Annan
	1875 Beck, Thomas Coker, Foleshill, Coventry— <i>Free Life Member.</i>
	1876 Beedie, James, The Mains, Ardlaw, Fraserburgh

Admitted

- 1876 Beedie, William, Pitgair, Fisherie, Turriff
 1871 Begbie, Joshua Arthur Howard, Toronto, Canada
 1852 Begbie, Thos., Queenston Bank, Drum
 1858 Begg, John, Distiller, Lochnagar, Aberdeen
 1876 Begg, John, Factor, Durriss Estate Office, Aberdeen
 1873 Begg, Robert, Blarnie, Luss
 1873 Begg, Robert Burns, Solicitor, Kinross
 1871 Beith, Donald, W.S., 15 Grosvenor Crescent, Edinburgh
 1871 Belfrage, A. W., C.E., 21 Ann Street, Edinburgh
 1849 Belfrage, G., 59 Forest Road, Edinburgh
 1849 Belfrage, Jas., Samuelston East Mains, Haddington
 1867 Bell, Alexander, Linton, Kelso
 1868 Bell, Alexander, Stobahill, Lockerbie
 1872 Bell, And., Fans, Earlston
 1856 Bell, David, Tolhall, Cupar Fife
 1871 Bell, George, Barns of Claverhouse, Dundee
 1863 Bell, James, 27 Rodney Street, Liverpool
 1871 Bell, John (of Castlecreavie), 47 Great King Street, Edinburgh
 1876 Bell, John, Maryhillock, Fraserburgh
 1871 Bell, M. Montgomery, W.S., 4 Forbes Street, Edinburgh
 1846 Bell, R., of Lunna, Belmont, Falkirk
 1869 Bell, Robert, 9 George Street, Perth
 1856 Bell, Thomas, Ballinshoe, Kirriemuir
 1865 Bell, Thomas, Craigkennoch, Burntisland
 1877 Bell, Thomas (Messrs Robey & Co.), Lincoln
 1871 Bell, William, of Gribdale, Kirkeudbright
 1869 Bell, William, Ceanaeoil, Strathbraan, Dunkeld
 1876 Bell, William, Sheriffhalls, Biggar
 1858 Benton, Joseph, Cattie, Whitehouse
 1875 Benton, William, Crookmore, Alford
 1858 Benton, Wm., Harthill, Whitehouse
 1869 Berry, George, Longicat, Horningsham Warminster, Wilts
 1848 Berry, John, of Tayfield, Newport, Fife
 1863 Berry, Walter, 16 Carlton Terrace, Edinburgh
 1861 Bertram, James, Addinston, Lauder
 1871 Bertram, John, Hartside, Lauder
 1854 Bertram, John S., Cranshaws, Dunse
 1845 Bertram, T. Hardy, C.E., 1 Foxgrave Road, Beckenham, Kent
 1852 Bertram, William, of Nisbet, Biggar

Admitted

- 1861 Berwick, David, Collairnie, Newburgh, Fife
 1876 Best, John, Inveravon, Polmont
 1857 Bethune, Admiral, of Balfour, C.B., Markinch
 1848 Bethune, Alex., of Blebo, Cupar-Fife
 1863 Bethune, Maj. R., of Nydie, St Andrews
 1864 Bethune, Murdo, Muirton, Beauly
 1861 Bett, David J., Newhall, Coupar-Angus
 1857 Bett, James, Bolfracks, Aberfeldy
 1859 Beveridge, David, Buckthorns, Largo
 1862 Beveridge, George, 248 High Street, Kirkealdy
 1851 Beveridge, J., of Balado, Kinross
 1869 Beveridge, James, Crombie, Dunfermline
 1853 Beveridge, Robert E., 8 Spence Street, Newington, Edinburgh
 1872 Beveridge, William, of Bonnyton, Dunfermline
 1862 Beveridge, William, 248 High Street, Kirkealdy
 1872 Bickerton, Rich., Tweedmouth Implement Works, Berwick-on-Tweed
 1858 Biggar, T., of Chapelton, Dalbeattie
 1859 Binnie, John, Birnieknows, Cockburnspath
 1875 Binny, Andrew, 9 Hart Street, Edinburgh
 1865 Binny, Graham, W.S., 9 Hart Street, Edinburgh
 1874 Bird, Ebenezer, Glenduckie, Newburgh, Fife
 1858 Bird, James B., Fishwick, Paxton
 1867 Birket, J., of Broom Rigg, Ainstable, Penrith
 1875 Bisco, John, Summerfield, St Ola, Orkney
 1874 Biscoe, T. Ramsay, yr. of Newton, Inverness
 1846 Biscoe, T. P. B., of Kingillie, Inverness
 1862 Bisset, The Ven. Archdeacon, Levenshinn, Hundy
 1873 Bisset, Hugh, Pittarrow, Laurencekirk
 1873 Bisset, Thos. S., Agricultural Engineer, Blairgowrie
 1869 Bisset, W. A., East Wemyss, Kirkealdy
 1865 Black, Alex., Shotover Estate Office, Wheatley, Oxon
 1876 Black, Charles Grant, Knock, Keith
 1875 Black, Gavin, Coalmaster, Easter Moffat, Airdrie
 1877 Black, James, of Auchentoshan, Duntocher
 1871 Black, James, *Elgin Courant Courier*, Elgin
 1851 Black, James, London

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| Admitted | Admitted |
| 1838 Black, James, Merchant, Glasgow | 1866 Bolam, Robert George, Weetwood Hall, Wooler |
| 1857 Black, James W., Wandel, Abington | 1858 Bolton, Joseph C., of Carbrook, Larterbert |
| 1875 Black, John, Coalmaster, Airdrie | 1867 Bone, Quintin, Greenan, Ayr |
| 1859 Black, John, Setonhill, Longniddry | 1853 Bontine, Wm. Cunninghame Graham of Gartmore, Stirling |
| 1859 Black, John, Ford, Westfield, Cornhill, Northumberland | 1870 Boog, Thomas Elliot, Timpendean, Jedburgh |
| 1876 Black, John, The Mains, Haddo House, Aberdeen | 1842 Booth, Jas. Godfrey, Seed Merchant, Hamburg |
| 1844 Black, Robert, Glasgow | 1875 Borland, Arch., Stewarton Street, Wishaw |
| 1867 Black, Robert, Liberton Mains, Liberton | 1862 Borland, Robert, Auchencairn, Closeburn |
| 1876 Blackburn, James of Killearn, Glasgow | 1871 Borthwick, Dr Alex. B., Dumfries |
| 1870 Blacklaw, Alex. Scott (late Milton of Arbuthnot, Fordoun), Brazil | 1873 Borthwick, Alex. Hay, Hopsrig, Langholm |
| 1855 Blackley, John, 107 Bath Street, Glasgow | 1859 Borthwick, Alex. Hay, St Dunstan's, Melrose |
| 1857 Blacklock, Adam, late Minnygap, Moffat | 1854 Borthwick, Gilbert, Frogden, Kelso |
| 1870 Blackstock, John, Haytoun Castle, Maryport | 1858 Borthwick, John, V.S., Kirkliston |
| 1875 Blackwood, Alex., Eshiels, Peebles | 1846 Borthwick, John, of Crookston, Heriot |
| 1842 Blackwood, John, Publisher, Edinburgh | 1859 Borthwick, John James M., Lynholm, Langholm |
| 1862 Blackwood, William, Publisher, Edinburgh | 1838 Borthwick, Thomas Chalmers, Hopsrig, Langholm |
| 1876 Blaikie, John, of Carron Lodge, Stonehaven | 1857 Borthwick, Wm. Henry, late Crookston, Gorebridge |
| 1854 Blair, Campbell, 36 Elmbank Crescent, Glasgow | 1865 Borthwick, Wm., Whitehaven Castle, Whitehaven |
| 1850 BLAIR, Sir Edward Hunter, of Blairquhan, Bart., Maybole | 1864 Borton, John, Barton House, Malton |
| 1869 Blair, E. J. Stopford, of Penninghame, Newton Stewart | 1858 BOSWALL, Sir Geo. Houston, of Blackadder, Bart., Chirnside |
| 1860 Blair, James, of Glenfoot, Tillicoultry | 1876 Bower, Alfred Lance, Strathaird House, Broadford |
| 1864 Blair, James, Aberfoyle | 1863 Bowhill, James, Banker, Ayton |
| 1874 Blair, John, 25 Greenhill Gardens, Edinburgh | 1854 Bowie, Alexander, Mains of Kelly, Arbroath |
| 1874 Blair, Patrick, Advocate, Sheriff-Substitute, Inverness | 1875 Bowie, Robert, Parkhead, Linlithgow |
| 1844 Blair, Captain William Fordyce, of Blair, R.N., Dalry | 1875 Bowie, Robert, Seedsman, 60 West Howard Street, Glasgow |
| 1876 Blake, John, Dunrobin Mains, Golspie | 1859 Bowman, James, Newark, St Monance |
| 1873 Bland, Thomas, Greystone, Tullynessle, Alford | 1863 BOWMONT, Most Noble the Marquis of, Floors Castle, Kelso |
| 1836 Blane, Colonel Robert, C.B. | 1865 Boyd, Colonel James Hay, of Townend, Symington, Kilmarnock |
| 1847 Blanshard, George, Smith's Place, Edinburgh | 1872 Boyd, John, Simprim Mains, Coldstream |
| 1843† BLANTYRE, Right Hon. Lord, Erskine House, Glasgow | 1861 Boyd, John B., of Cherrytrees, Kelso |
| 1877 BLANTYRE, The Hon. the Master of, Sciberscross, Rogart | 1863 Boyd, Wm. B., Ormiston, Kirkbank, Kelso |
| 1861 Blues, Andrew A., Dalruscan, Tinwald, Dumfries | 1875 Brackenridge, Alex., V.S., Stevenston Mains, Holytown |
| 1861 Blyth, D., Leckiebank, Auchtermuchty | 1869 Brakenridge, William, Liddell Bank Canonbie |
| 1872 Blythe, William, Whitrigs, Hawick | 1865 Braid, Andrew, Humbie, Kirknewton |
| 1871 Bogie, George, of Gairney Bridge, Kinross | 1858 Brand, Charles, Mains of Fordoun, Fordoun |
| 1851 Bogie, J., Balcanquhal, Auchtermuchty | 1872 Brand, James, Dunbar |
| 1863 Bolam, John, Chathill, Northumberland | |

Admitted	Admitted
1855 Brash, James, Hallyards, Kirkliston	1855 Brown, James, 80 South Portland Street, Glasgow
1871 BREADALBANE, Right Hon. the Earl of, Taymouth Castle, Aberfeldy	1873 Brown, James Geddes, Distiller, Keith
1876 Brebner, Alex., Balquhindochoy, Methlie	1837 Brown, James T., late of Auchlochlan, Lesmahagow
1876 Brebner, Robert, Lumbs, Lonmay, Aberdeen	1872 Brown, John, Blinkbonny, Gorebridge
1873 Breingan, Alex., Helensburgh	1857 Brown, John, Boghall, Biggar
1869 Brewster, Robert, Branchal, Kilmalcolm	1876 Brown, John, of Colton, Dunfermline
1872 Brigham, John, Castle Gate Implement Works, Berwick-on-Tweed	1860 Brown, John, Ingliston, Dumfries
1865 Brims, James, Thurso	1852 Brown, John George, Cluny Cottage, Pitlochry
1868 Broadwood, Thomas, of Fulfordlees, Crowhill, Dunbar	1876 Brown, John H., Morvich, Kintail
1876 Brock, J. E., East Overton, Kirkliston	1860 Brown, John C., Crofthead, Annan
1874 Brock, John, Aukhorne, Wick	1870 Brown, Jos., Hermitage, Dalbeattie
1873 Brock, William, Barns of Clyde, Yoker	1876 Brown, Joseph, Suttiewalls, Fordoun
1857 Brockley, Robert M., Gourlaw, Rosewell	1832 Brown, Matthew, Greenock
1875 Brodie of Brodie, Brodie Castle, Forres	1861 Brown, Oliphant, Shiel, New Galloway
1859 Brodie, James, 9 Nelson Street, Edinburgh	1856 Brown, Peter, Craigton, Bishopton
1848 Brodie, James C., Thorntonloch, Dunbar	1871 Brown, Peter, Milton of Lunearthy, Redgorton
1869 Brodie, James W., Cloheen, Buttevant, Co. Cork	1856 Brown, Robert, Auctioneer, Balfour
1872 Brodie, John, Palacehill, Ancrum, Jedburgh	1866 Brown, Robert, Little Ley, Cluny, Aberdeen
1840 Brodie, J. Clerk, of Idvies, W.S., 26 Moray Place, Edinburgh	1866 Brown, Robert E., F.G.S., Farnley Hall, Otley, Yorkshire
1874 Brodie, J. C. J., of Lethen, Nairn	1875 Brown, Thomas, Pentland Mains, Loanhead
1874 Brooke, A. B., Cardney, Dunkeld	1849 Brown, Thomas, Weston, Dunsyre, Dolphinton
1872 Broom, William, of Girgenti, 182 Hope Street, Glasgow	1863 Brown, Thos., late Locherlour, Crieff
1855 Broomfield, Thomas Lauder	1863 Brown, Thomas, 4 Carlung Place, Edinburgh
1867 Bromfield, W. J., Old Greenlaw, Greenlaw, Dunse	1871 Brown, William, Factor, Earlsmill, Forres— <i>Free Life Member</i> , 1873
1875 Brothie, George, of Firbo, Firbo House, Westray, Kirkwall	1855 Brown, Dr William, late Melrose
1854 Broughton, Robert Henry, of Rowchester, Greenlaw	1872 Brown, William, Parkgatestone, Biggar
1863 Brown, Adam (late Helmburn, Selkirk), Devonshire	1854 Brown, William, Linkwood, Elgin
1844 Brown, Alex. J. Dennistoun, of Balloch, Balloch Castle, Dumbarton	1873 Brown, William, Pitnamoon, Laureneckirk
1873 Brown, Alexander, Banker, Oban	1874 Browne, A. H., Doxford Hall, Chathill, Northumberland
1852 Brown, Andrew, M.D., late Edinburgh	1873 Browne, Colvile, Long Melford, Suffolk— <i>Free Life Member</i>
1858 Brown, Archibald, Craig, Uduy	1872 Brownlie, Alex., Haughhead, Earlstoun
1874 Brown, Archibald C., Gladstone, Bishopton	1875 Brownlie, James, Holchouseburn, Fauldhouse
1866 Brown, David, Banker, Maybole	1875 Brownlie, Thomas, 182 Hope Street, Glasgow
1871 Brown, George, Grassmiston, Craik	1868 Bruce, Alex., Millhill, Mintlaw
1872 Brown, George, Writer, Pollokshaws	1874 Bruce, Andrew Hamilton Tyndall, of Falkland, Ladybank
1839 Brown, George, Watten Mains, Watten	1862 Bruce, Charles, Broadland, Huntly
1851 Brown, George, of Westfield, Cupar Fife	1864 Bruce, George, Pennan farm, Banff
1860 Brown, James, Hardgrave, Lockerbie	1868 Bruce, George, Heatherwick, Keith Hall
1865 Brown, James, Whippark, Kilmarnock	1874 Bruce, George, Wealthiton, Keig, Aberdeenshire
1861 Brown, Jas., Leuchars Castle, Leuchars	1871 Bruce, George C., C.E., Edinburgh
	1875 Bruce, Henry, of Ederline, Lochgilphead

Admitted

- 1865 Bruce, James, Burnside, Fochabers
 1876 Bruce, James, Collithie, Gartly
 1869 Bruce, Jas., Longbridgemoor, Annan
 1868 Bruce, J., Inverquhomery, Mintlaw
 1829 Bruce, John, of Sumburgh, Lerwick
 1863 Bruce, J., jun., Sumburgh, Lerwick
 1842 Bruce, John, W.S., 7 Melville Crescent, Edinburgh
 1876 Bruce, Peter, Myreton, Inch, Aberdeen
 1868 Bruce, Robert, Manor House Farm, Great Smeaton, Northhallerton
 1871 Bruce, Robert, Uddingston
 1875 BRUCE, Hon. Robt., Preston, Broomhall, Dunfermline
 1852 BRUCE, Hon. Thomas Charles, M.P., 13 Hertford Street, Mayfair, London
 1855 Bruce, Thomas, of Arnot, Kingsdale, Kennoway
 1864 BRUCE, Sir William C., of Stenhouse, Bart., Falkirk
 1875 Bruce, William L., Glenkill, Lam-lash
 1870 Bruges, Edward C., Dalgig, New Cum-nock
 1866 Brunton, James, Broomlands, Kelso
 1867 Brunton, J. S., Ladhope House, Gala-shiels
 1870 Bryan, F. G. D., Drumpellier, Coat-bridge
 1865 Bryce, James, East Whitburn, Whitburn
 1862 Brydon, Adam, Netherbarns, Gala-shiels
 1864 Brydon, H., Thirlestane Hope, Selkirk
 1850 Brydon, James, Kinnelhead, Moffat
 1864 Brydon, James, jun., Holm of Dalqu-hairn, Dalry, New Galloway
 1857 Brydon, John, Mounthooly, Jedburgh
 1873 Brydon, Robert, The Dene, Seaham Harbour—*Free Life Member*
 1877 Bryson, Robert, Master of the Mer-chant Co., 66 Princes Street, Edin-burgh
 1850 Bryson, Robert, Merchant, Glasgow
 1852 Bryson, W. G., Cullen House, Cullen
 1828*†BUCCLEUCH and QUEENSBERRY, His Grace the Duke of, K.G., Dalkeith
 1835 BUCCLEUCH and QUEENSBERRY, Her Grace the Duchess of
 1854 Buchanan, A., Whitehouse, Stirling.
 1857 Buchanan, Alex., Norwood, Milngavie
 1827 Buchanan, Andrew, of Mount Vernon, Shettleston
 1838 Buchanan, Andrew, of Auchintorlie, Bowling
 1870 Buchanan, Archibald, Barskimming, Mauchline
 1849 Buchanan, Lieut.-Col. David C. R. Carrick, of Drumpellier, Coatbridge

Admitted

- 1873 Buchanan, David, Garscadden Mains, New Kilpatrick
 1853 Buchanan, Dun., Auchenbreck, Colin-traive, Greenock
 1851 Buchanan, Isaac, Hamilton, Canada
 1838 Buchanan, James, Glasgow
 1876 Buchanan, Captain James R. Gray, of Scotstone, Western Club, Glasgow
 1838 Buchanan, John, London
 1844 Buchanan, J., Coneyhill House, Bridge of Allan
 1872 Buchanan, John, C.E., 24 George Street, Edinburgh
 1876 Buchanan, Robt., Blairquhosh, Strath-blane
 1873 Buchanan, Robert, Letter Farm, Kil-learn
 1864 Buchanan, Robert M., Livingston Mill, Mid-Calder
 1842 Buchanan, Walter, Glasgow
 1828 Buchanan, Wm., Merchant, Glasgow
 1875 Buchanan, William, 391 Parliamentary Road, Glasgow
 1842 Buist, James, of Lawpark, St Andrews
 1863 Buist, Robert, Cattle Salesman, 11 West Lauriston Place, Edinburgh
 1865 Bulloch, Ar., Milliken, East Kilpatrick
 1875 Bulloch, Matthew, 11 Park Circus, Glasgow
 1870 BURDETT-COUTTS, Right Hon. Baroness, Ehrenberg Hall, Torquay
 1874 Burn, Forbes, Hardacres, Coldstream—*Free Life Member*
 1863 Burn, John, Ednam, Kelso
 1873 Burness, Wm., Redford, Laurencekirk
 1877 Burnett, Alex. E., W.S., 7 Howe Street, Edinburgh
 1867 Burnett, Major-General Francis Claude, of Gadgirth, Tarbolton
 1848 Burnett, George, Advocate, 21 Walker Street, Edinburgh
 1840 Burnett, Gregory, Dee Cottage, Flint
 1834 Burnett, Newell, Advocate, Aberdeen
 1858 BURNETT, Sir Robert, of Leys, Bart., Crathes Castle, Banchory
 1838 Burnley, W. F., 24 Ainslie Pl., Edin.
 1872 Burns, And., Harelaw, Longniddry
 1865 Burns, Jas. C., of Glenlee, Hamilton
 1865 Burns, J., of Castle Wemyss, Greenock
 1861 Burns, John William, of Kilmahew, Dumbarton
 1875 Burr, Alexander, Tulloford, Tarves
 1867 Burr, Rev. P. Lorimer, Lundie Manse, Dundee
 1873 Burrell, James, Denovan Mains, Denny
 1854 Burroughs, Col. F. W. Traill, of Rou-say, Orkney
 1867 Burton, J. Tait, of Toxside, Ratho Hall, Ratho
 1857 Burton, J., Rosewell Mains, Rosewell

Admitted	Admitted
1869†BUTE, Most Noble the Marquis of, K.T., Mount Stuart, Rothesay	1845 CAMPBELL, Sir Alex., of Barcaldine, Bart.
1861 Buttar, David, Corston, Coupar-Angus	1837 Campbell, Alex., of Auchindarroch, Lochgilphead
1877 Butter, Albert, Union Bank, Edinburgh	1835 Campbell, Alexander, of Cammo, 6 Charlotte Square, Edinburgh
1825 Butter, Arch., of Faskally, Pitlochry	1857 Campbell, A., Crosshill, Bishopbriggs
1869 Butter, Colonel Archibald, yr. of Faskally, Pitlochry	1868 Campbell, Alex., Blairton, Bellhelvie
1876 Buyers, James, junior, Easter Brakie, Arbroath	1863 Campbell, A. H., of Little Grove, Herts
1844 Buttery, A. W., Cardarrach House, Airdrie	1857 Campbell, Lt.-Col. Archd., of Blythwood, Renfrew
1875 Byron, Commander Richard H., Engliston, Inverness	1868 Campbell, A., Dunmore Park, Stirling
1844 Cadell, Alex. Todd, R.A., V.C., Madras	1865 Campbell, Lt.-Col. A. H., Retired List, Bengal Army, late Easter Elchies, Craigellachie
1856 Cadell, Henry, of Grange, Bo'ness	1865 Campbell, Lt.-Col., of South Hall, Greenock
1869 Cadzow, James, Clarendon, Linlithgow	1854 Campbell, Arthur, of Catrine, W.S. 4 Randolph Crescent, Edinburgh
1872 Calzow, Robt., Thornyhill, Carmichael, Lanark	1876 CAMPBELL, Sir Archibald S.L., of Succoth, Bart., Garscube, Glasgow
1869 Caird, Alex. McNeel, Genoch, Dunragit, Wigtownshire	1864 Campbell, C. Macpherson, of Ballimore, Kincorth House, Forres
1853 Caird, James, of Cassencarie, C.B., 8 Queensgate Gardens, London	1853 Campbell, Chas. V. H., of Nether Place, Mauchline
1864 Cairns, James, Balquharn, Menstrie	1847 Campbell, C., of Colgrain, Camis Eskan House, Helensburgh
1870 Cairns, John, Cults Lime Works, Ladybank	1838 Campbell, C. G., of Stonefield, Tarbert
1861 Cairns, William, Bellie, Auchterarder	1858 Campbell, Rear-Admiral Colin Yorke, of Barbreeck, Lochgilphead
1871 Cairns, Robert, Bertha Park, Perth	1875 Campbell, Captain Duncan, yr. of Inverneil and Ross, Ardrishaig
1845†CAITHNESS, Right Hon. the Earl of, Barrogill Castle, Wick	1868 Campbell, Captain D. P. (of Balliveolen, Bonaw), New Club, Edinburgh
1872 Calder, Adam, Yetholm Mains, Kelso	1857 Campbell, Donald, Killiemore, Aros
1853 Calder, Francis, Yetholm Mains, Kelso	1858 Campbell, D. T., Duiletter, Dalnally
1857 Calder, James, Colgrain, Cardross	1839 Campbell, Farquhar (of Rum), New Club, Edinburgh
1870 Calder, John, Muirton, Elgin	1871 Campbell, George, Rhodes, North Berwick
1846 Calder, Marcus, Elwickbank, Kirkwall	1873 Campbell, George, Kilkea, Mageney, Co. Kildare— <i>Free Life Member</i>
1857 Calder, Robert, Little Swinton, Coldstream	1863 Campbell, George William, Mayfair, London
1858 Calder, R., White-house, Lumphanan	1835 Campbell, Colonel George J., of Cessnock, Treesbank House, Kilmarnock
1851 Calder, W., Cattle Salesman, 19 Archibald Place, Edinburgh	1867 Campbell, Hector A. (of Auchnacloch, Oban), Ardfenaig, Bunnellan, Mull
1872 Calder, W. A., Oxenrig, Coldstream	1834 CAMPBELL, Sir Hugh Hume, of Marchmont, Bart., Dunse
1841 Caldwell, Fred., of Missinish, 4 Hanover Terrace, Regent's Park, London	1861 Campbell, Hugh, Surgeon, Glenralloch, Tarbert, Lochline
1862 Caldwell, Wm., Boydstone, Ardrossan	1838 CAMPBELL, Sir Jas., of Aberuchil, Bart., Wheatmead Park, Lydney
1857 Cameron, Alex., late Old Inns, Cumbernauld	1875 Campbell, James, Fairyknowe, Ecclefechan
1865 Cameron, Alex. (of Mainhouse), Highfield, Elgin	1838 Campbell, James, London
1859 Cameron, Donald, of Lochiel, M.P., Auchnacarry, Fort-William	1847 Campbell, J., of Tillichewan, Dumbarton
1861 Cameron, D. Colin, Tallisker, Broadford, Skye	1877 Campbell, Jas., Ormaig, Lochgilphead
1869 Cameron, Duncan, Banker, Thurso	
1857 Cameron, James, Balnakeyle, Munlochry	
1871 Cameron, John, Glæckeriska, Appin	
1876 Cameron, J. C., of Garrows, Amulree, Dunkeld	
1859 Cameron, P., 6 Regent Terrace, Edin.	
1862 Cameron, William, Edinburgh	

Admitted

- 1833 Campbell, James Archd., of New Inverawe, Rugby
 1849 Campbell, James A., of Stracathro, Brechin
 1860 Campbell, James G., of Killyleoch, 23 Windsor Street, Edinburgh
 1874 Campbell, John, of Kilberry, Tarbert
 1848 Campbell, John, of Possil, Torquay
 1846 Campbell, J. L., of Achalader, Blairgowrie
 1857 CAMPBELL, Lt.-Gen. Sir John, C.B. and K.C.S.I., United Service Club, Edin.
 1874 Campbell, John, 15 Exchange Square, Glasgow
 1857 Campbell, Jn., Rhemeul, Campbeltown
 1857 Campbell, John, of Inverardoch, Doune
 1865 Campbell, John D., of Peaton, Clachan, Roseneath, Helensburgh
 1863 Campbell, John Graham, of Shirvan, Castleton, Lochgilphead
 1875 Campbell, John R., Inveruglas, Arrochar
 1863 Campbell, Neill Colquhoun, of Barnhill, Sheriff of Ayr, 81 Great King Street, Edinburgh
 1838 Campbell, Ord Graham, 5 Oxford Terrace, Edinburgh
 1836 Campbell, R. D., of Jura, Jura House, Portaskaig, Greenock
 1802 Campbell, R., of Sonachan, Inveraray
 1861 Campbell, R. F. F., of Craigie, Ayr
 1877 Campbell, Robert Hume, of Glendaruel, Argyllshire
 1858 Campbell, Silvester, Kinellar, Blackburn, Aberdeen
 1876 Campbell, Silvester, jun., Kinellar, Blackburn, Aberdeen
 1860 Campbell, Thos., Croftness, Aberfeldy
 1864 Campbell, T. H., of Millfield, Polmont
 1856 Campbell, T. W., of Walton Park, Dalbeattie
 1839 Campbell, W., of Ormsary, Ardrishaig
 1858 Campbell, William, Solicitor, 14 Almada Street, Hamilton
 1861 Campbell, W., Cladville, Islay
 1871 CAMPERDOWN, Right Hon. the Earl of, Camperdown, Dundee
 1877 Cannon, John, Congeith, Kirkcunzeon
 1863 Cant, James, Orr Bridge, Kirkealdy
 1852 Cantlie, Wm., Keithmore, Dufftown
 1850 Carfrae, T., Land-Surveyor, 9 Osborne Terrace, Edinburgh
 1845 Carlyle, T. J., of Templehill, Waterbeck, Ecclefechan
 1856 CARMICHAEL, Sir William H. Gibson, of Castle Craig and Skirling, Bart., Dolphinton
 1871 Carmichael, William, Pool, Carnwath
 1856 CARNEGIE, Hon. Charles, Kinnaird Castle, Brechin

Admitted

- 1847 Carnegie, D., of Stronvar, Lochearnhead
 1869 Carnegie, Henry L., of Kinblethmont, Arbroath
 1852 Carnegie, James, W.S., 16 Windsor Street, Edinburgh
 1836 Carnegie, John, of Redhall, Fordoun
 1873 Carnegie, John, Grain and Commission Agent, Stirling
 1858 Carnegie, William, of Eastertown, Dumlappie, Brechin
 1858 Carnegie, W., junior, Coul, Forfar
 1850 Carnegie, John, Glasgow
 1861 Carphin, George, Banker, Dunkeld
 1869 Carphin, Jas. Rhind, C.A., 31 George Street, Edinburgh
 1876 Carre, Thomas A. Riddell of Caverscarre, St Boswells
 1871 Carrick, Charles, Baad, Stirling
 1872 Carrick, Thos. A., Easter Cambusdrennie, Stirling
 1854 Carruthers, John, of Miln, Kirkhill, Moffat
 1870 Carruthers, John, Tundergarth, Lockerbie
 1870 Carruthers, Joseph, Broomhill, Annan
 1875 Carruthers, Robert, jun., *Courier* Office, Inverness
 1870 Carruthers, R. B., Huntingdon Lodge, Dumfries
 1848 Carruthers, Wm. Francis, of Dormont, Lockerbie
 1838 Carstairs, Drysdale, Hailes House, Fairfield, Liverpool
 1869 Carswell, David, jun., Straiton, Leuchars
 1864 Carter, Walter, Bank Agent, Ayton
 1868 Cartwright, T. R. B. Leslie-Melville, Melville House, Ladybank
 1861 Carver, John, Kinloch, Meikle
 1871 CATHCART, Lieut.-Colonel the Hon. Adolphus F., Caldera, Dunse
 1834 CATHCART, Sir John Andrew, of Carleton, Bart., Killochan Castle, Girvan
 1857 Cathcart, R., of Pitcairrie, Auchtermuchty
 1872 Catley, W. E., of Edderton, Ospisdale, Dornoch
 1866 Cattanach, A., of Auchintorlie, Paisley
 1873 Cave-Browne, Rev. W. H., 12 Richmond Road, Brighton
 1876 Cavens, Thomas, Birkshaw, Glencairn, Dunscore
 1871 Caverhill, John, Greenburn, Ayton
 1839 CAWDOR, Right Hon. the Earl, Stackpole Court, Pembroke, South Wales
 1874 Chalmers, Archibald, of Kipp, Dalbeattie.
 1824 Chalmers, C., of Monkshill, Rothiebrisanne, Fyvie

Admitted	Admitted
1871 Chalmers, James, Shielhill, Stanley, Perth	1835 Christie, Captain James, Hillend, Clackmannan
1860 Chalmers, Thomas, of Longcroft House, Linlithgow	1876 Christie, James, Sunnyside, Prestonkirk
1864 Chambers, Robert, 10 Claremont Crescent, Edinburgh	1846 Christie, John, 10 Pitville Parade, Cheltenham
1870 Chambers, Thos., of Pelutho, Abbey Town, Cumberland	1872 Christie, John, of Cowden, 19 Buckingham Terrace, Edinburgh
1869 Chambers, William, of Glenormiston, Edinburgh	1874 Christie, John, Gifford Bank, Haddington
1864 Chambers, William, Soutarton, Forgue Huntly	1861 Christie, P., Mains of Scotseraig, Tayport
1849 Chancellor, J.G., of Shieldhill, Biggar	1857 Christie, T. C., of Bedlay, Moodiesburn
1857 Chandler, Henry, Salford	1848 CHRISTSON, Sir Robert, Bart., M.D. Professor of Materia Medica, University of Edinburgh
1869 Chaplin, Geo. C. Child, of Colliston, Arbroath	1871 Chrystal, George, Engineer, Perth
1873 Chapman, James, Ballenerieff Mill, Bathgate	1834 Chrystie, Captain A., late H.E.I.C.S.
1873 Chapman, Mungo, Auctioneer, Bathgate	1855 Church, D. M., Ferniebank, Liberton
1873 Charles, John, Town and County Bank, Inverurie	1838 Church, J., Sark Tower, Canonbie
1876 Charlton, John, Corn-merchant, Dumfries	1859 Clapperton, Jas., Garvald Mains, Prestonkirk
1867 Charlton, Matthew, jun., Browdean-laws, Jedburgh	1855 Clapperton, John, Newlands, Gifford
1860 Cheape, Lieut.-Col. Charles, of Kiln-dine, Lochaline, Morven, Argyllshire	1864 Clapperton, John, 371 High Street, Edinburgh
1864 Cheape, G. C., of Strathtyrum Well-field, Strathmiglo	1877 Clark, Andrew, Manswrae, Bridge of Weir
1875 CHESHAM, Right Hon. Lord, Latimer, Chesham, Bucks	1869 Clark, Archd., Garvie, Colintrave
1874 CHETWYND, Captain the Hon. Henry W., R.N., Mayne, Elgin	1853 Clark, Archibald, Inverchapple, Kilmun
1838 Chiene, Geo. Tod, C.A., 27 Northumberland Street, Edinburgh	1838 Clark, Francis William, of Ulva, Aros
1860 Chirnside, G., Edrington House, Berwick	1864 Clark, James, Oldhamstocks Mains, Cockburnspath
1865 Chisholm, The, Erchless Castle, Inverness	1857 Clark, John, Flender, Busby
1865 Chisholm, Duncan, Treenlaur, Newport, Mayo, Ireland	1869 CLARK, Sir John F., of Tillypronie, Bart., Tarland
1874 Chisholm, John, Commission Merchant, Inverness	1858 Clark, John Gilchrist, of Speddoch, Dabton, Thornhill
1854 Chisholm, John, Charleston, Inverness	1872 Clark, John M., of Garthdee House Aberdeen
1874 Chisholm, John, Ironmonger, Inverness	1867 Clark, Lachlan, Tangy, Campbeltown
1850 Christie, Andrew, Addinston, Traucut	1869 Clark, Matthew, Glasgow
1850 Christie, Charles J., Westbank, Traucut	1872 Clark, M., of Little Culmain, Crockettford, Dumfries
1862 Christie, C. J., Grove House, Bonnington	1871 Clark, Robert, Taybank House, Errol
1864 Christie, George, Southfield House, Stirling	1873 Clark, William, Northfield, Denny
1873 Christie, James, Bankend, Stirling	1857 Clark, William, Shawhill, Monkton
1865 Christie, James, Blandfield, Edinburgh	1871 Clark, William, Starr, Cupar Fife
1873 Christie, James, Cultenhove Mains, St Ninians	1873 Clark, Rev. Wm. Aitkinson, Belford Hall, Belford, Northumberland
	1847 Clarke, Alexander, of Rosemount, Tain
	1865 Clarke, Alexander M., Meddat, Parkhill
	1871 Clarke, J. F., Cowgask, Auchterarder
	1869 Clarke, John, Spindlehowe, Uddingston
	1873 Clarke, William, Hopewell, Tarland

Admitted

- 1854 Clay, John, Kerchesters, Kelso
 1870 Cleghorn, Hugh, M.D., of Stravithy, St Andrews
 1875 Clelland, James, Knockenlaw, Kilmarnock
 1877 Clench, Fred. (Messrs Robey & Co.), Lincoln
 1876 Clerk, Sir George Douglas of Penicuik Bart., Penicuik
 1860 Clerk, Duncan, Writer, Oban
 1875 Clerkson, Alexander, Lyden, Kirknewton
 1871 CLINTON, Right Hon. Lord, Fettercairn House, Fettercairn
 1850 Clouston, Peter, Glasgow
 1871 Clyne, David, Reaster House, Wick
 1852 COATS, Sir Peter, of Woodside, Paisley
 1852 Coats, Thomas, of Ferguslie, Paisley
 1861 Cochrane, Alexander, of Ashkirk, Hawick
 1842 Cochrane, Alex. Baillie, of Lamington, M.P., Lamington
 1849 Cochrane, James, 40 Greenhill Gardens, Edinburgh
 1858 Cochrane, James, Little Haddo, Newburgh, Aberdeen
 1877 Cochrane, James, Logan, Ardwell
 1861 Cockburn, George, Kilchiaron, Portcharlotte, Islay
 1866 Cockburn, Arch. D., 6 Athole Crescent, Edinburgh
 1830 Cogan, Robert, Merchant, Glasgow
 1870 Coghill, George, 141 Cumberland Street, South Side, Glasgow
 1838 COLBROKE, Sir Thomas Edward, of Crawford, Bart., M.P., Abington
 1868 Collie, Alexander W., 11 Drummond Street, Edinburgh
 1843 Collier, John, Hatton House, Carnoustie
 1857 Collyer, William D., of Cormiston, Biggar
 1873 Colquhoun, George, Shemore, Luss
 1872 COLQUHOUN, Sir James, of Luss, Bart., Ross-dhu, Luss
 1876 Colquhoun, Major James, Arrochar House, Arrochar
 1850 Colquhoun, J., Corkerhill, Pollokshaws
 1874 Colquhoun, Rev. J. E. Campbell, Chartwell, Westerham, Kent
 1872 Colthart, Robert, Achateny, Ardnarmurchan
 1851 COLVILLE of Culross, Right Hon. Lord, K. T., 42 Eaton Place, London
 1871 Colvin, James E., Wester Manbeen, Elgin
 1874 Colvin, John, Solicitor, Inverness
 1860 Colvin, William, of Craigielands, Moffat

Admitted

- 1873 Common, James, Capplefoot, Lockerbie
 1871 Comrie, Alex., E. Ballindean, Inchture
 1874 Conacher, P. M., Gallin Cottage, Glenlyon, Aberfeldy
 1873 Coningham, W. J. C., High Street, Haddington
 1852 Conning, John, Solicitor, Perth
 1875 Constable, Alex. Cowan, 10 Morning-side Place, Edinburgh
 1852 Constable, G., of Soylziary, Balmyle, Blairgowrie
 1854 Constable, James C., of Cally, Blairgowrie
 1860 Constable, James, of Glencraig, Lochgelly
 1864 Constable, Rev. John, Principal of the Royal Agricultural College, Cirencester
 1871 Cook, Charles, Invercauld Arms, Ballater
 1841 Cook, John, W.S., 11 Great King Street, Edinburgh
 1876 Cook, Thomas W., Castleton, of Asloun, Alford
 1865 Cooper, Alexander, Solicitor, Elgin
 1845 Cooper, H. R., of Ballindalloch, Balfroun
 1845 Cooper, William, of Failford, Smithstone House, Tarbolton
 1874 Cooper, William S. yr. of Failford, 1 Alva Street, Edinburgh
 1876 Copland, Alex., Manager, Aberdeen, Commercial Co., Aberdeen.
 1855 Copland, R., Mill of Ardlethen, Ellon
 1864 Copland, Jn., Mainshead, Dumfries
 1840 Cordiner, W. F., Mormond House, Cortes, Lonmay
 1860 Corrie, Adam, South Park, Kirkcudbright
 1874 Costine, John, of Lochvale, Dumfries
 1864 Cotesworth, Robert, Cowdenknowes, Melrose
 1873 Coubro, John, Hawkhill, Kincardine-on-Forth
 1857 Coubrough, A., Biggarshields, Biggar
 1875 Coubrough, Archd., High Craigton, Milngavie
 1852 Coubrough, J., Blairtummock, Lennoxton
 1876 Coubrough, William, Sornfallow, Wiston, Biggar
 1859 Coupar, John, Balrownie, Brechin
 1869 Couper, Jn. Cardno, of Craigiebuckler, Aberdeen
 1865 Cousin, George, 12 Royal Exchange, Edinburgh

Admitted

- 1864 Cousland, James, Banker, Denny
 1858 Coutts, William, Banff
 1844 Coventry, Andrew, 29 Moray Place, Edinburgh
 1864 Coventry, Wm., Pleasance, Aberdour, Fifeshire
 1871 Cowan, Dr Alex., East Morningside House, Edinburgh
 1857 Cowan, Andrew, Spittalhill, Fintry
 1836 Cowan, C., of Logan House, Wester Lea, Murrayfield
 1860 Cowan, Charles W., yr. of Logan House, Penicuik
 1875 Cowan, Daniel, 228 Dobbie's Loan, Glasgow
 1869 Cowan, George, Mains of Park, Glencuce
 1872 Cowan, George, Valleyfield, Penicuik
 1873 Cowan, James, 10 North Queen Street, Glasgow
 1874 Cowan, James, M.P., 35 Royal Terrace, Edinburgh
 1858 Cowan, John, of Beeslack, Milton Bridge
 1875 Cowan, John, Churchill House, Paisley
 1854 Cowan, Richard, St Kilda, Sidmouth, Devon
 1861 Cowan, Robert, W.S., 9 Carlton Terrace, Edinburgh
 1862 Cowan, Robert, Park Mains, Paisley
 1872 Cowan, William, Banker, Ayr
 1870 Cowe, George, Balhousie, Carnoustie
 1872 Cowe, Peter, Lochton, Coldstream
 1870 Cowe, Robert, Old Castles, Chirnside
 1872 Cowe, William, Butterdean, Grant's House
 1868 Cowie, Alexander, Darley, Auchterless, Turriff
 1853 Cowie, Alexr., Crombly Bank, Ellon
 1852 Cowie, James, Sundridge Hall, Bromley, Kent
 1876 Cowie, James, Woodbine Cottage, Stonehaven
 1877 Crabbie, John, of Duncow, 22 Royal Terrace, Edinburgh.
 1877 Crabbie, John M., yr of Duncow, 33 Chester Street, Edinburgh.
 1870 Craig, Daniel, Barr, Sanquhar
 1855 Craig, David, 4 Pitt Street, Portobello
 1873 Craig, D. B., Mount Pleasant, Thur o
 1875 Craig, H. V. Gibson, W.S., 2 South Charlotte Street, Edinburgh.
 1850 Craig, James, 33 Manor Place, Edinburgh
 1857 Craig, J., of Craigharroch, Priestshields, Muirkirk
 1863 Craig, James H. Gibson, yr. of Riccarton, Currie

Admitted

- 1857 Craig, John, Guelt, Cumnock
 1867 Craig, John, Jellyhill, Bishopbriggs
 1857 Craig, John, Littlehill, Bishopbriggs
 1860 Craig, Josh., of Threecrofts, Lochrutton
 1870 Craig, Robert, Carruchan, Troqueer, Dumfries
 1867 Craig, Robert, Auchentiber, Greenock
 1868 Craig, Robert (Frances Lowe and Co.), Chapelton, Jamaica
 1824 CRAIG, Right Hon. Sir William Gibson, of Riccarton, Bart., Currie—*Treasurer of the Society*
 1859 Craig, William, Laurel Bank, Dumfries
 1870 Craig, William, Buckley, Bishopbriggs
 1855 Craig, William C., Anneston, Biggar
 1862 Craig, W., Urquhart, Dunfermline
 1875 Craig, William, Implement Maker, Old Meldrum
 1873 Craighead, James, Sillyflat, Bervie
 1858 Craigie, Wm. Roper, Tom an Droighne, Ballinluig
 1863 Craike, Charles, late Esbie, Lochmaben
 1876 Cran, James, jun., Farnton, Inverkindie, Aberdeen
 1871 Cran, John, Kirkton, Inverness
 1875 Cran, Robert, Fingask Mains, Beauly
 1872 Cranston, James, Holystone, Thornhill
 1849 Cranston, George Cranston Trotter, of Dewar, Harvieston, Gorebridge
 1859 Cranston, William S., Dyke, Moffat
 1850 Crawford, Adam, Royal Terrace, Edinburgh
 1853 Crawford, Alexander, Writer, Dunse
 1871 Crawford, Andrew, Pitlowie, Glencarse
 1860 Crawford, D., Dyckhill, Milton of Campsie
 1855 Crawford, James Coutts, of Overton, Strathaven
 1854 Crawford, John, The House of Tongue, Lairg
 1865 Crawford, John, Milnstonford, West Kilbride
 1867 Crawford, Muir, 6 Bank Street, Leith
 1857 Crawford, P., Dumgoyack, Strathblane
 1875 Crawford, Robert, of Lochsannish, Campbelltown
 1866 Crawford, R., Balbongie, Inverkeithing
 1860 Crawford, William, Bargarvie, Perth
 1875 Crawford, William, Hillhead, Carnwath
 1838 Crawford, W. S. Stirling, of Milton, Glasgow
 1866 Crause, Wm., 6 George Square, Edinburgh

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|---|---|
| Admitted | Admitted |
| 1875 Crerar, Donald, Innerhadden, Rannoch | 1874 CUMMING, Sir William G. Gordon, of |
| 1861 Crerar, John, Drumatherty, Dunkeld | Altyre, Bart., Forres |
| 1850 Creyk, Dr A., Dalvey, Advie, Strath- | 1850 Cuninghame, D., Chapelton, Ard- |
| spey | rossan |
| 1838 Crichton, Hew, S.S.C., 13 Nelson | 1857 Cunliff, Richard Steedman, Carlton |
| Street, Edinburgh | House, Stirling |
| 1849 Crichton, Hew Hamilton, W.S., 13 | 1867 Cuninghame, Captain John, of Bal- |
| Nelson Street, Edinburgh | gowrie, Culross, Alloa |
| 1847 Crichton, James Arthur, Advocate, | 1854 Cunningham, A. G., Rosebank, Currie |
| Sheriff of Fife, 13 Nelson Street, | 1863 Cunningham, C. R., Grahamslaw, |
| Edinburgh | Kelso |
| 1849 Crichton, John, of Lynn, Dalry, Ayr | 1870 Cunningham, C., V.S., Slateford |
| 1859 Crichton, William, Live Stock Agent, | 1872 Cunningham, C. J., The Tofts, More- |
| Haddington | battle, Kelso |
| 1870 Critchley, J. A., Stapleton Tower, | 1873 Cunningham, David, Freugh, Stranraer |
| Annan | 1864 Cunningham, J., Tarbreoch, Dalbeattie |
| 1872 Croall, John, Coach Works, Kelso | 1866 Cunningham, J. Barré, of Hensol, |
| 1875 Croall, Robert, Job and Postmaster, | Castle-Douglas |
| Craigcrook Castle, Edinburgh | 1864 Cunningham, J. C., 102 West Bow, |
| 1835 Crombie, A., of Thornton, Laurence- | Edinburgh |
| kirk | 1852 Cunningham, John Sinclair, 102 West |
| 1858 Crombie, Alex., yr. of Thornton, W.S., | Bow, Edinburgh |
| 59 Frederick Street, Edinburgh | 1867 Cunningham, John, Trees, Maybole |
| 1870 Cromarty, William, Widewall, St | 1857 Cunningham, J., Whitecairn, Dal- |
| Margaret's Hope | beattie |
| 1845 Cross, David (of Knockdon, Maybole), | 1864 Cunningham, J. M., Assistant-Man- |
| Seed Merchant, 51 Argyle St., Glasgow | ager Clydesdale Banking Company, |
| 1852 Cross, Robert, Uddingston | Glasgow |
| 1865 Crossman, M. G., Bridgend, Berwick | 1851 Cunningham, T., Dalachy, Aberdour |
| 1858 Cruickshank, Amos, Sittyton, Aber- | 1836 Cunningham, W. A., of Logan, Cum- |
| deen | nock |
| 1868 Cruickshank, Andw., Conland, Huntly | 1859 Cunningham, W. C. S., of Caprington, |
| 1847 Cruickshank, Anthony, Aberdeen | Kilmarnock |
| 1868 Cruickshank, Edward C., Lethenty, In- | 1867 CUNNYNGHAM, Sir Robert K. A. Dick, |
| verurie | of Prestonfield, Bart., Edinburgh |
| 1874 Cruickshank, George, Ardmore, Tain | 1871 Curr, Henry, Pitkellony House, |
| 1852 Cruickshank, George, Comisty, Huntly | Muthill |
| 1876 Cruickshank, James, Ladysford, Fraser- | 1870 Currie, David, of Craigshields, Moffat |
| burgh | 1853 Currie, James, Halkerston, Gorebridge |
| 1871 Cruickshank, John, Barmuckity, Elgin | 1872 Currie, James J., Yorkston, Gore- |
| 1852 Cruickshank, John, Kock, New | bridge |
| Spynie, Elgin | 1863 Currie, Wm., of Linthill, St Boswells |
| 1875 Cruickshank, John, Longcrook, Craigel- | 1854 CURRIEHILL, Hon. Lord, 6 Randolph |
| lochie | Crescent, Edinburgh |
| 1876 Cruickshank, John W., Lethenty, | 1849 Curror, Adam, The Lee, Edinburgh |
| Inverurie | 1867 Curror, David, of Wester Craigduckie, |
| 1876 Cruickshank, William, Cairnglass, | 25 Northumberland St., Edinburgh |
| Lonmay, Aberdeen | 1848 Curror, John, of Nivingston, Comis- |
| 1865 Cruickshank, Wm., Milton of Brach- | ton, Lofhian Burn |
| lich, Fort-George Station | 1869 Curror, John F., Myreside, Edinburgh |
| 1865 Crum, Alexander, Roukin, Thornlie- | 1873 Curror, Patrick Robert, The Lee, |
| bank, Glasgow | Edinburgh |
| 1876 Cullen, Archd., Woodend, Airdrie | 1872 Curror, Peter, Coxithill, Stirling |
| 1868 Cumming, George, Writer, Banff | 1836 Cuthbertson, William, Merchant, Glas- |
| 1865 Cumming, Henry Gordon, Pittyvaich, | gow |
| Dufftown | |
| 1874 Cumming, James, Allanfearn, Inver- | 1874 Dahl, Ferdinand August, Director of |
| ness | the Royal Higher Agricultural School |
| 1876 Cumming, William, V.S., 83 Rose | at Aas, Christiania— <i>Honorary Asso-</i> |
| Street, Edinburgh | <i>ciate</i> |

Admitted	Admitted
1876 Dakers, James, 24 Union Row, Aberdeen	1864 Davidson, J., Land Steward, Crathes Castle, Banchory
1875 Dalgleish, George, Rosebery Mains, Temple	1874 Davidson, Lachlan, Caledonian Bank, Kingussie
1857 Dalgleish, John J., of Ardnamurchan, 8 Athole Crescent, Edinburgh	1834 Davidson, P., of Inchmarlo, Banchory
1858 Dalgleish, L., of Dalbeath, 8 Athole Crescent, Edinburgh	1865 Davidson, Robert, Mayfield, Inverness
1857 Dalglisb, Robert, of Kilmardinny, Glasgow	1872 Davidson, William, Colmslie, Galashiels
1876 DALHOUSIE, Right Hon. the Earl of Dalhousie Castle, Bonnyrigg	1850 Davidson, William J., of Ruchill, Bardowie, Milngavie
1853† DALKEITH, Right Hon. the Earl of, K.T., M.P., Eildon Hall, Newtown St Boswells	1866 Davidson, W. G., of South Fod, Bogie House, Kirkealdy
1874 Dallas, A. G., of Dunain, Inverness	1848 DAVIE, Sir H. R. F., of Creedy, Bart., M.P., Crediton, Devon
1875 Dangerfield, Edw., Balboughty, Perth	1859 Dawson, John, Swinton Bridge End, Coldstream
1862 Dalrymple, Charles, of Hailes, M.P., 39E Onslow Square, London, S.W.	1876 Dawson, William, The Farm, Gordon Castle, Fochabers
1868 Dalrymple, C. Elphinstone, of Kinellar Lodge, Blackburn, Aberdeen	1864 Dawson, Wm., Warriston, Hermiston
1865 DALRYMPLE, Hon. G. Grey, Elliston House, St Boswells	1876 Dean, George, Brangan, Boyndie, Portsoy
1841 DALRYMPLE, Sir Hew, of North Berwick, Bart., Luchie, North Berwick	1857 Deans, J. Y., of Kirkstyle, Kilmarnock
1857 Dalrymple, James, of Woodhead, Kirkintilloch	1850 Deans, Peter D., Mount Charles, Portobello
1859 Dalrymple, Jas., of Langlee, Galashiels	1838 DEAS, Hon. Lord, 32 Heriot Row, Edinburgh
1866 DALYELL, Sir R. A. O., of Binns, Bart.	1823 Dempster, G., Ormiston Hall, Tranent
1835 Dalzell, James Allen, North Berwick	1854 Denholm, Alex., Bailtaws, Lamington
1860 Dalziel, Alex., Glenwharrie, Sanquhar	1877 DENMAN, Right Hon. Lord, Alderston, Haddington
1860 Dalziel, George, Merkland, Thornhill	1850 Dennistoun, Alex. H., Glasgow
1870 Dalziel, Geo., Auchengruith, Sanquhar	1875 Dent, Irvine, Ravensnook, Penicuik
1873 Dalziel, George, W.S., 53 Melville Street, Edinburgh	1832 Dewar, Lieut.-Col. A. C., of Vogrie, Ford
1869 Dalziel, James, Tinwaldshaws, Dumfries	1864 Dewar, A., Arnprior, Kippen, Stirling
1857 Darling, Adam, Governor's House, Berwick	1872 Dewar, David, Shaw of Touch, Stirling
1863 Darling, J. Stormonth, of Lednathie, W.S., 64 Northumberland Street, Edinburgh	1860 Dewar, G. I., United Service Club, Edinburgh
1863 Darling, T., Mordington Mains, Berwick	1873 Dewar, James, Cairnston, Dunblane
1839 Darling, Wm., Priestlaw, Cranshaws	1872 Dewar, James, 9 Alston Street, Glasgow
1865 Darroch, D., of Gourack, Torridon, Auchnasheen	1877 Dewar, James Cumming, yr. of Vogrie, Ford
1855 Davidson, Alex., Mains of Cairnbrogie, Old Meldrum	1873 Dewar, John, Doune Castle Farm, Doune
1872 Davidson, And., Brewer, Coldstream	1861 Dewar, John, Wine Merchant, Perth
1824 Davidson, Dun., of Tulloch, Dingwall	1864 Dewar, Peter, King's Park, Stirling
1864 Davidson, Duncan H. C. R., yr. of Tulloch, Dingwall	1864 Dewhurst, G. C., of Aberuchil, Comrie
1860 Davidson, George, Walton, Linlithgow	1856 Dick, Dr John, late Broombank, Mid-Cadder
1870 Davidson Gilbert, Banker, Hawick	1875 Dick, John, Ironfounder, Willow Park, Airdrie
1848 Davidson, H., of Muirhouse, Davidson's Mains, Edinburgh	1868 Dick, Wm., of Tullymet, Ballinluig
1841 Davidson, Henry M., Sheriff-Clerk, Haddington	1859 Dickenson, Wm., Longcroft, Lauder
1870 Davidson, Hugh, of Braedale, Lanark	1869 Dickie, Joseph, Union Bank, Dunkeld
	1867 Dickie, Robt., Killoonan, Campbeltown
	1870 Dickie, William, Balgerran, Castle-Douglas
	1869 Dickinson, George T., of Wheelbirks, Newcastle-on-Tyne

Admitted

- 1870 Dickson, Alex., of Hartree and Kil-
bucho, M.D., Professor of Botany,
University of Glasgow
1854 Dickson, Archibald, Bughtrig, Cold-
stream
1850 Dickson, James J., C.A., 13 Clarendon
Crescent, Edinburgh
1858 Dickson, James A., Woodville,
Arbroath
1862 Dickson, J. H., of Corstorphine, Saugh-
ton Mains, Edinburgh
1846 Dickson, John, W.S., Greenbank,
Perth
1858 Dickson, John F., Panbride House,
Carnoustie
1876 Dickson, Patrick, Laureekirk
1870 Dickson, R. A., Merchant, Dumfries
1860 Dickson, T., Drumeruil, Thornhill
1871 Dickson, Dr Walter G., 3 Royal Circus,
Edinburgh
1874 Dickson, W. L., Drummelzier Haugh,
Biggar
1851 Dingwall, William, Ramornie, Lady-
bank
1863 Dinning, John, The Terrace, Belford.
Northumberland
1860 Dirom, Col. Thomas Pasley, of Mount
Annan, Annan
1849 Dixon, Thomas G., Nant Hall, Rhyl
1876 Dixon, W.S., Belleisle, Ayr
1866 Dobbie, John, Campend, Dalkeith
1862 Dobie, David, Tinwald House, Dum-
fries
1863 Dodd, Nicholas, Nisbet, Kelso
1863 Dodd, James, Messburnford, Jedburgh
1837 Dodd, William, Merchant, Glasgow
1857 Doddrell, George J., 51 Belmont Ter-
race, Hillhead, Glasgow
1865 Dodds, James, Moncrieff Bank, Perth
1844 Dodds, J., Cranston Riddell, Dalkeith
1863 Dodds, William, Elwarthlaw, Green-
law
1871 Doe, John, Agricultural Implement
Maker, Errol
1858 Don, Alexander, Keirsbeath, Dun-
fermline
1853 Donald, Jas., Deebank Cottage, Crathes,
Aberdeen
1876 Donaldson, Alexr., Auchip, Fordyce.
Portsoy
1871 Donne, Henry, Leek Wootton, War-
wick
1865 Dougall, Adam, Stewarton, Kirkinner
1865 Dougall, Andrew, Railway Manager,
Inverness
1857 Dougall, Admiral W. H. Maitland,
R.N., of Scotsraig, Tayport
1875 Douglas, Mrs. Green, Kilmalcolm
1875 Douglas, Arch., 228 Dobbie's Loan,
Glasgow

Admitted

- 1868 Douglas, Archibald C., of Mains, Miln-
gavie
1868 Douglas, Arthur Henry Johnstone, of
Lockerbie
1858 Douglas, Bentlem, Peffer Mill, Liberton
1866 Douglas, E. O., of Killiechassie, Aber-
feldy
1839 Douglas, F. B., Advocate, Edinburgh
1851 DOUGLAS, Sir Geo. H. S., of Spring-
wood Park, Bart., M.P., Kelso
1873 Douglas, J. H. S., yr. of Springwood
Park, Kelso
1871 Douglas, George, Upper Hindhope,
Jedburgh
1874 Douglas, Rev. Geo. Robinson, of
Orchardton, Castle-Douglas
1867 Douglas, George Sholto, 7 Pentland
Terrace, Edinburgh
1863 Douglas, James, of Cavers, 22 Gilmore
Place, Edinburgh
1869 Douglas, John, Calrossie, Nigg, Ross-
shire
1873 Douglas, John, Marionburgh, Ballin-
dalloch
1861 Douglas, Thomas, Clyth, Wick
1872 Douglas, Thos., Swinside Townhead,
Jedburgh
1874 Douglas, William, Arboll, Fearn
1854 Douglass, Alex. Forbes, Haddo House
Mains, Aberdeen
1864 Douie, John R. L., Factor, Polmaise,
Stirling
1853 Dove, John, Eastfield, Greenlaw,
Dunse
1871 Dowal, Charles, Kelly Bleachfield,
Arbroath
1858 Dowell, Alex., 13 Palmerston Place,
Edinburgh
1873 Downie, George, Balcomie, Crail
1869 Downie, Hay, Corstorphine
1838 Downie, John, Merchant, Glasgow
1867 Downie, Wm., Linton Mains, Cluny,
Aberdeen
1857 Drennan, James, Auchinlee, Ayr
1872 Drever, James, Askernish, South Uist,
Lochmaddy
1870 Drew, James, of Craigenallie, Doon-
hill, Newton-Stewart
1850 Drew, Lawrence, Merryton, Hamilton
1857 Drief, James, New Zealand
1861 Dron, William, Crieffevechter, Crieff
1861 DRUMMOND, Hon. Francis, 58 St
George's Square, London, S.W.
1852 Drummond, Charles Home, of Blair-
Drummond, Stirling
1873 Drummond, James, jun., Blacklaw,
Dunfermline
1859 Drummond, Henry, Seedsman, Stirling
1864 Drummond, John, of Balquhandy, late
Guilton Rectory, Wingham, Kent

Admitted
 1871 Drummond, John, of Blackruthven, Perth
 1852 Drummond, J. M., of Megginch, Errol
 1875 Drummond, Robert, Pocknave, Craigie, Kilmarnock
 1828 Drummond, Thomas, of Craigie, Dundee
 1870 Drummond, W. P., 52 George Street, Edinburgh
 1858 Drybrough, Thos., 40 Drummond Place, Edinburgh
 1869 Dryburgh, J., Kininmonth, Cupar Fife
 1863 Dryden, W., Land-Steward, Springwood Park, Kelso
 1871 Drysdale, Alex., S. St Andrew Street, Edinburgh
 1873 Drysdale, David, Lorns Hill, Alloa
 1864 Drysdale, Henry, Mains of Aberdalgie, Perth
 1873 Drysdale, Robert, Old Mills, Craigforth, Stirling
 1861 Drysdale, Wm., of Kilrie, North Pittcadie, Kinghorn
 1868 Duckering, R. E., Northorpe, Kirton Lindsey
 1870 Dudgeon, Alex., East Dalmeny, Edinburgh
 1869 Dudgeon, George, Almondhill, Kirkliston
 1850 Dudgeon, James, Upper Keith, Edinburgh
 1840 Dudgeon, John, 17 Kensington Gate, London
 1862 Dudgeon, J. S., Longnewton, St Boswells
 1856 Dudgeon, John B., Craukaig, Golspie
 1851 Dudgeon, Patrick, of Cargen, Dumfries
 1843 DUDLEY, Right Hon. the Earl of, Dudley House, Park Lane, London
 1866 DUFF, Hon. George Skene, Montpelier House, Banff
 1874 Duff, George Smyttan, Sanquhar House, Forres
 1868 Duff, Col. James, Knockleith, Turriff
 1875 Duff, James, Factor, Blackwood, Lesmahagow
 1865 Duff, James, Freeland, Bridge of Eorn
 1858 Duff, Laclan Duff Gordon, of Drummuir, Keith
 1866 Duff, Robert W., of Fetteresso, M.P., Stonehaven
 1874 Duff, Thomas, of Garth, Aberfeldy
 1858 Duguid, P., of Cammachmore, Aberdeen
 1871 Dun, John, jun., Gale-hills
 1873 Dun, Peter, Kephill Villa, Kippen
 1839 Dunbar, Sir Archd., of Northfield, Bart., Duffin House, Elgin
 1876 Dunbar, Garden Duff, of Hempriggs, Ackerhill Tower, Wick

Admitted
 1845 DUNBAR, Sir William, of Mochrum, Bart., Newton-Stewart
 1876 Dunbar, William, Union Bank, Turriff
 1851 Duncan, Alex. (of Providence, Rhode Island), Knossington Grange, Oakham, Rutland
 1875 Duncan, Alex., Birgidale Knock, Rothesay
 1857 Duncan, Alex., Pusk, Leuchars
 1875 Duncan, Alex. R., yr. of Parkhill, Gavell House, Kilsyth
 1876 Duncan, Charles, Advocate, Aberdeen
 1875 Duncan, Charles, Upper Seoulag, Butte
 1872 Duncan, Charles, of Meadowcap, Rothesay
 1858 Duncan, D. H., Friock Mains, Arbroath
 1843 Duncan, George, The Vine, Dundee
 1868 Duncan, James, Killychonan, Rannoch
 1869 Duncan, James, Panlathie Mill, Carnoustie
 1871 Duncan, James, of Benmore, Kilmun, Greenock
 1875 Duncan, James, Rhubodach, Rothesay
 1871 Duncan, John, yr. of Kinkell, Beggall, St Andrews
 1858 Duncan, John, Ardo, Methlic
 1855 Duncan, Robert, of Kirkmay, Crail
 1868 Duncan, R., Auchentulzie Mains, Banff
 1848 Duncan, William, S.S.C. 13 Abercromby Place, Edinburgh
 1876 Duncan, William, 18 York Place, Edinburgh
 1868 Duncan, W. J., National Bank, Edinburgh
 1876 Dundas, Chas. Henry, Dundra, Crieff
 1847 Dundas, Robert, of Arncliffe, Gorebridge
 1864 DUNGLASS, Right Hon. Lord, Newton Don, Kelso
 1857 Dunlop, Alexander, Glasgow
 1876 Dunlop, Colin Robert, of Quarter, Hamilton
 1869 Dunlop, Gabriel, Castle Farm, Stewarton
 1819 Dunlop, George, late Edinburgh
 1872 Dunlop, George, junior, 11 Hill Street, Edinburgh
 1844 Dunlop, James, of Artlurdee, Barrhead
 1859 Dunlop, J., Queen's Hotel, Kirn, Dunoon
 1875 Dunlop, Quintin, Maristown, Maybole
 1871 Dunlop, Robert, Aulton, Kilmangy
 1853 Dunlop, William H., of Annahill, Kilmarnock
 1862 DUNMORE, Right Hon. the Earl of, Dunmore Park, Stirling
 1854 Dunn, Adam, Tranent Mains, Tranent
 1858 Dunn, A., Wester Leochel, Craigievar

Admitted

- 1863 Dunn, David, 33 Rock Park, Rock Ferry, Liverpool
 1876 Dunn, John, Corn-merchant, Kelso
 1853 Dunn, William, Redden, Kelso
 1858 Durie, David, Nether Mill, Fettercairn
 1855 Durie, Robert Hogg, Barney Mains, Haddington
 1874 Durno, James, Jackstown, Rothienorman
 1868 Durno, John, Lambhill, Inch
 1874 Durno, John, Sunnyside, Rothienorman
 1847 Duthie, Alex., of Ruthrieston, 6 Great King Street, Edinburgh
 1868 Duthie, William, Banker, Tarves
 1869 Dykes, John, jun., 79 St Vincent Street, Glasgow
 1875 Dykes, Robert, Laigh Hillhouse, Troon
 1876 Dykes, Thomas, The Castle, Maybole
 1832 Dyson, Thos. C., of Willowfield, Halifax, Yorkshire
 1871 Easson, David, Camperdown, Dundee
 1860 Easson, Robt., Scones, Lethendy, Perth
 1865 Eden, Right Rev. Bishop, Hedgefield House, Inverness
 1871 Eden, Henley, Factor, Aberdalgie House, Perth
 1874 Edgar, John, Kirkettle, Roslin
 1871 Edgeley, Robert, Gilmerton, Edinburgh
 1857 Edgeley, Thomas, Gilmerton, Edinburgh
 1864 Edington, Peter, Thornhill, Muthill
 1863 Edmiston, Hugh Fleming, Bossfield, East Kilbride
 1869 Edmond, David, of Ballochruin, Balfon
 1877 Edmond, Alex., yr. of Kingswells, Countesswells, Aberdeen
 1876 Edmond, Francis, of Kingswells, Countesswells, Aberdeen
 1873 Edmond, Wm., Cowie, Bannockburn
 1873 Edmond, William, Hillhead of Catter, Drymen
 1858 Edmonds, Leonard, London
 1869 Edmondston, D. C., Ordale, Bala-sound, Unst, Lerwick
 1875 Edmondston, Mrs. of Buness, Lerwick
 1873 EDMONSTONE, Admiral Sir Wm., of Duntreath, Bart., M.P., Colziua Kilsyth
 1876 Edward, George, 14 Haddow Street, Aberdeen
 1859 Edwards, Matthew, late Hilton, Alloa
 1865 Edwards, Dr. J., Birchfield, Abernethy, Grantown
 1863 EGLINTON and WINTON, Right Hon. the Earl of, Eglinton Castle, Irvine

Admitted

- 1847 ELCHO, Right Hon. Lord, M.P., Gosford, Haddington
 1854 Elder, James, Whitehill Mains, Musselburgh
 1854 Elder, Thomas, Wedderburn Mains, Edrom
 1872 Elder, William, Implement Maker, Berwick-on-Tweed
 1873 Eley, William Henry, Islingham, Frindsbury, Rochester, Kent—*Free Life Member*
 1875 ELGIN and KINCARDINE, Right Hon. the Earl of, Broomhall, Dunfermline
 1874 ELIBANK, Right Hon. Lord, Darnhall, Eddleston
 1875 ELLESMERE, Right Hon., the Earl of, Worsley Hall, Manchester
 1836 Ellice, Edward, of Glengarry and Glenquoich, M.P., 28 Grosvenor Square, London
 1869 Elliot, A. T., Newhall, Galashiels
 1863 Elliot, Henry, Greenriver, Hawick
 1853 Elliot, James, Galalaw, Kelso
 1871 Elliot, James Scott, Blackwood, Dumfries
 1875 Elliot, James T. S., yr. of Wolflee, Hawick
 1854 Elliot, John, Primrosehill, Dunse
 1863 Elliot, John, of Binks, Burnmouth, Newcastleton
 1863 Elliot, John, The Flat, Newcastleton
 1874 Elliot, Matthew, Flesher, Inverness
 1848 Elliot, Robert, Laighwood, Dunkeld
 1874 Elliot, Robt. Henry, of Clifton Park, Kelso
 1852 Elliot, Thomas, Hindhope, Jedburgh
 1854 Elliot, Thomas, Blackhaugh, Galashiels
 1873 Elliot, Thomas John, Langley Park, Norwich—*Free Life Member*
 1861 ELLIOT, Sir Walter, of Wolflee, K.C.S.L., Hawick
 1860 Elliot, Walter, Hollybush, Galashiels
 1866 Elliot, Walter, Hermitage, Newcastleton
 1872 Elliot, Wm. B., of Benrig, St Boswells
 1872 Elliot, William, Perth Brewery, Perth
 1871 Ellison, Ralph Carr, of Dunstan Hill, Gateshead
 1860 ELPHINSTONE, Right Hon. Lord, Carberry Tower, Musselburgh
 1867 ELPHINSTONE, Hon. Edward Charles Buller, Carnock House, Larbert
 1868 ELPHINSTONE, Hon. George James, Lismore, Oban
 1840 ELPHINSTONE, Sir James D. H., of Horn and Logie Elphinstone, Bart., M.P., Pitcaple
 1841 Errington, Rowland, of Sandhoe, Northumberland

Admitted	Admitted
1854 ERROL, Right Hon. the Earl of, Slains Castle, Ellon	1874 Fell, John Duncan, Flesher, Blairgowrie
1874 Erskine, Henry, Dalladies, Brechin— <i>Free Life Member</i>	1863 Fender, Robert, Northfield, Coldingham
1862 Erskine, H. D., of Cardross, Stirling	1872 Fenwick, James, Leadketty, Dunning
1862 Erskine, J. E., of Linlathen, Broughty Ferry	1871 Fenwick, James, Factor, Redgorton, Perth
1859 Erskine, Vice-Admiral John E., The Albany, London	1874 Fergus, William, Craigour, Liberton
1860 ERSKINE, Sir Thomas, of Cambo, Bart., St Andrews	1876 Ferguson, Archd. A., Gosfield, Essex— <i>Free Life Member</i>
1873 Eskdale, John, Muirdean, Kelso	1871 Ferguson, Lieut. Col. George A., of Pitfour, Mintlaw
1875 Ewart, Henry, Tynninghame, Prestonkirk	1875 Ferguson, John, Banker, Carnwath
1858 Ewing, Robert, West Town, Tarland	1824 Ferguson, John, of Knockindale
1857 Ewing, Alex. Crum., yr. of Strathleven, Polmont Park, Polmont	1863 Ferguson, John, Burghlee, Loanhead
1851 Ewing, Arch. Orr, of Ballikrain, M.P., Killearn	1855 Ferguson, John, East Grange, Forres
1857 Ewing, Humphrey Ewing Crum, of Strathleven, Ardencaple Castle, Helensburgh	1860 Ferguson, John, Brae of Coynach, Mintlaw
1838 Ewing, John Orr, Glasgow	1846 Ferguson, J., of Kilquhanity, Dalbeattie
1868 Fair, Frederick, late St Andrews	1870 Ferguson, John, Seed Merchant, Sanguhar
1863 Fair, John S. Elliot, Wells, Jedburgh	1875 Ferguson, Peter, Renfrew
1864 Fairholme, Geo. K. Erskine, of Old Melrose, Melrose	1858 Ferguson, Thomas, Kinnochtry, Coupar-Angus
1831 Fairrie, John, Merchant, London	1868 Ferguson, Thomas, Alton of Coynach, Mintlaw
1851 Falconar, Peter, 70 High Street, Old Aberdeen	1836 Ferguson, Samuel R., of Middlehaugh, 4 Abbotsford Crescent, St Andrews
1858 Falconer, Don., Milton of Conon, Arbroath	1870 Ferguson, Wm., of Kinmundy, Mintlaw
1873 Falconer, William, Candy, Drumlithie	1854 FERGUSON, Right Hon. Sir James, of Kilkerran, Bart., Maybole
1849 FALSHAW, Right Hon. Sir James, Bart., Lord Provost of Edinburgh, 14 Belgrave Crescent	1870 Ferme, Charles, Blackhall, Tullyallan, Kincairdine-on-Forth
1860 Farish, Samuel, Kirklands, Lockerbie	1869 Ferme, George, Darmouth Grove, Blackheath, London
1852 Farquhar, Arthur, of Elsieck, W.S., 6 Bon-Accord Square, Aberdeen	1875 Fernie, James A., Hilton, Alloa
1876 Farquhar, Captain, of Maryfield, Muirsk House, Turriff	1853 Fernie, J. C., Union Club, St Andrews
1856 Farquharson, F., Builder, Haddington	1864 Field, Rev. Edward Burch, of Moreland, 43 Moray Place, Edinburgh
1874 Farquharson, James C., Banchoir, Kingussie	1864 Field, James Hamilton, yr. of Moreland, 59 Frederick Street, Edinburgh
1865 Farquharson, James Ross, of Invercauld, Braemar	1869 Field, Sydney, Aberdeen
1865 Farquharson, J., 4 Bridge Street, Aberdeen	1840† FIFE, Right Hon. the Earl of, K.T., Duff House, Banff
1852 Farquharson, James, Banker, Auchinblae	1857 Findlay, Colonel John, Woodbank, Dumbarton
1871 Farquharson, James, East Town, Tarland	1873 Findlay, Chas. Bannatyne, of Boturich, Dumbarton
1843 Farquharson, Major-General Francis	1855 Findlay, Robert, of Springhill, Baillieston, Glasgow
1857 Farquharson, Robert O., of Haughton, Alford	1847 Finlay, Thomas Dunlop, of Easterhill, Glasgow
1858 Farrell, Alfred Herbert William, Davo House, Fordoun	1857 Finlay, W., Brackenbrae, Bishopbriggs
1857 Farrell, M., of Woodburnden, Fordoun	1844 Finlay, A. S., of Castle Toward, Greenock

Admitted

- 1859 Finlay, John, Lochend, Lochgelly
 1869 Finlay, John H., W.S., 14 South Charlotte Street, Edinburgh
 1870 Finlay, Kirkman, of Dunlossit, Portaskaig, Islay
 1870 Finnie, C. J. Macara, Swanston, Lothian Burn
 1874 Finnie, William, of Newfield, Kilmarnock
 1874 Fisher, Arthur William, Hedgefield, Inverness
 1873 Fisher, Donald, Jellyholm, Alloa
 1861 Fisher, Donald, The Hotel, Pitlochry
 1873 Fisher, Henry, Balbeuchly, Dundee
 1871 Fisher, John, Birnam
 1870 Fisher, John, Knells, Carlisle
 1877 Fiske, Thomas Robt. Hay, Delamere Villas, Dewsbury Road, Leeds
 1861 Fleming, Alexander, Raith, Rothwell
 1852 Fleming, L., Mains of Fullwood, Paisley
 1867 Fleming, David, Avonmill, Hamilton
 1876 Fleming, David Gibson, Arduilie, Dingwall
 1869 Fleming, George, Crofthead, Mid-Cadder
 1857 Fleming, James, Coats, Penicuik
 1854 Fleming, James, Three-Mile-Town, Linlithgow
 1864 Fleming, James, Carmuir, Falkirk
 1864 Fleming, J. N., of Keil, 2 Brook Street, Manchester
 1857 Fleming, John, Hawkwood, Strathaven
 1865 Fleming, J., 18 Leadenhall Street, London
 1870 Fleming, John, Meadowbank Cottage, Strathaven
 1875 Fleming, John, Woodside, Rutherglen
 1876 Fleming, J. B., 241 St Vincent Street, Glasgow
 1857 Fletcher, Archibald, Tyndrum
 1870 Fletcher, Bernard Jas. C., of Somerton Hall, Norfolk
 1848 Fletcher, Major C. E., late of Corsock
 1865 Fletcher, James, of Rosehaugh, Avoch
 1857 Fletcher, J., yr. of Salton, Tranent
 1875 Fletcher, John, Bangour, Uphall
 1872 Flint, Alex., Nether Mains, Chirnside
 1869 Flint, David, Drylaw Mains, Davidson's Mains
 1861 Flockhart, J., Banker, Colinsburgh
 1865 Foggo, Robert Gordon, Invercauld Office, Ballater
 1872 FORBES, Right Hon. Lord, Castle Forbes, Keig
 1876 Forbes, Alex., Pitfourie, Pitlochry
 1850 Forbes, Arthur, of Culloden, Inverness
 1876 Forbes, Arthur Edward Whitmore, Wentworth Woodhouse, Rotherham

Admitted

- 1828 FORBES, Sir Charles, of Newe and Edinglassie, Bart., Strathdon
 1856 Forbes, Charles William, late Moniak Castle, Inverness
 1870 Forbes, Chas. W. L., Aberfeldy
 1874 Forbes, D. Geo. of Millburn, Inverness
 1830 Forbes, George, Merchant, London
 1865 Forbes, Duncan, of Leanach, Culloden House, Inverness
 1830 Forbes, James Stewart, Edinglassie, Strathdon
 1862 Forbes, James Ochonar of Corse, Lumphanan
 1874 Forbes, James, Tombreck, Glenbucket, Aberdeen
 1842 Forbes, Major-General John, of Inverernan, C.B., Strathdon
 1850 Forbes, John, of Haddo, Huntly
 1872 Forbes, John, Pitellachie, Coldstone, Tarland
 1857 FORBES, Sir William of Craigievar, Bart., Fintray House, Aberdeen
 1835 Forbes, W., of Medwyn, 17 Ainslie Place, Edinburgh
 1860 Forbes, William, of Callendar, Falkirk
 1874 Forbes, William Forbes, of Lochcote, Bathgate
 1849 Ford, Wm., Hardengreen, Dalkeith
 1868 Fordyce, James Dingwall, of Culsh, Advocate, 34 Great King Street, Edinburgh
 1871 Forgan, Andrew, Inch, Pittenweem
 1873 Forgan, James, jun., Sunnybraes, Leven
 1831 Forman, Jn. Nairne, W.S., 8 Heriot Row, Edinburgh
 1863 Forman, John, 51 Great King Street, Edinburgh
 1852 Forman, Robt., Keith House, Upper Keith
 1873 Forrest, Abram, of Calderhead, Auld-houseburn, Muirkirk
 1857 Forrest, David, of Treesbanks, Shotts
 1843 Forrest, James, jun., Kirriemuir
 1870 FORREST, Sir John, of Comiston, Bart.
 1867 Forrest, John Clark, of Auchenraith, Hamilton
 1863 Forrest, Peter, City of Glasgow Bank, Shotts
 1863 Forrest, William, of Lawmuir, Allanton, Hamilton
 1842 Forrester, John, W.S., 8 Drummond Place, Edinburgh
 1876 Forrester, Robert, of Carbeth, Killearn
 1865 Forsyth, David, Town Clerk, Elgin
 1863 Forsyth, George, Ashybank, Hawick
 1872 Forsyth, Jas. (Hooper & Co.), Kelso
 1874 Forsyth, Jas. Noel Muller, of Quinish, Tobermory, Mull

Admitted	Admitted
1855 Forsyth, John, Balnagown Estates Office, Parkhill	1869 Fraser, Wm., Chemical Manufacturer, Broxburn
1874 Forsyth, William Banks, of the <i>Inverness Advertiser</i> , Inverness	1852 Fraser, William, of Kilmuir, Skye
1873 Fortescue, Archer, of Swanbister, Kingcausie, Aberdeen	1861 Fraser, Wm., Greenhill, Dunning
1857 Fortune, George, Barnsmuir, Craig	1865 Fraser, Wm., Annfield, Inverness
1854 Fortune, William R., of Muircambus, Colinsburgh	1873 Fraser, Wm. A., Brackla, Nairn
1869 Foulis, Sir James Liston, of Colinton, Bart., St Andrews	1859 Frazer, John, Overton, New Abbey, Dumfries
1875 Foulds, A. R., of Clerkland, Stewarton	1857 Frederick, D., of Gass, Drumbreddan, Stranraer
1870 Foulds, James, Cavens, Dumfries	1869 Frederick, Robert, Drumflower, Glenluce
1846 Fowler, Henry Mackenzie, of Raddery, Fortrose	1868 Freeland, Jas., Broadgate, Strathblane
1874 Fowler, William, of Aslead, Turriff	1855 French, James Sortkjeer, Fredericks-haven, Denmark
1876 Fowlie, George, V.S., Downiehills, Peterhead	1870 French, Thomas, Nether-ton, Abington
1849 Fox, Michael, jun., late Glencorse Mains, Penicuik	1875 Frew, Robert, Sinclairton, Kirkealdy
1838 Fox, Richard M., of Foxhall, Rathowen, Ireland	1867 Frew, Thomas, 67 Great Western Road, Glasgow
1870 Fox, Wm., the Abbey, St Bees	1854 Friar, Thos., of Grinden Ridge, Northam-on-Tweed
1857 Foyer, David, Knowhead, Campsie	1875 Frier, Matthew, Kidston Mill, Peebles
1872 France, C. S., Bank House, Penicuik	1873 Fryer, John J., Music-seller, Dumfries
1867 France, Robert, Lowan Bank, Bridge of Allan	1857 Fulton, Andrew, 86 George St., Edinburgh
1874 France, Thomas, Ironmonger, Elgin	1863 Fulton, Wm., Hatchetnize, Coldstream
1874 Fraser, Alex., Barrisdale, Inverness	1847 Fyfe, John, late of Dalmarnock, Glasgow
1857 Fraser, Alexander, Solicitor, 22 Union Street, Inverness	1861 Fyfe, Robert, junior, Arlary, Kinross
1868 Fraser, Alex. (Neill & Co.), Edinburgh	1875 Fyfe, William, Newton of Glamis, Glamis
1865 FRASER, Col., the Hon. A. E., Eilan Aigeas, Beaully	1868 Gairdner, Chas., Union Bank, Glasgow
1820 Fraser, A. T. F., of Abertarff, Inverness	1873 Galashan, Chas. C., Saddler, Alloa
1840 Fraser, Evan Baillie, Balloan Cottage, Inverness	1857 Galbraith, Alex., Croy Cunningham, Killearn
1869 Fraser, Fran. G., of Findrack, Terphins	1872 Galbraith, John, Edentaggart, Lass
1869 Fraser, Colonel Fred. Mackenzie, of Castle Fraser, Aberdeen	1873 Galbraith, Thos. L., Town Clerk, Stirling
1873 Fraser, H. Newby, Portkilm House, Roseneath	1864 Galloch, J., Knockhill, Bridge of Allan
1853 Fraser, Hugh, Balloch of Culloden, Inverness	1860 GALLOWAY, Right Hon. the Earl of, Galloway House, Garliestown
1856 Fraser, Hugh, 29 Arundell Gardens, Kensington Park, London	1874 Galloway, Alex., C.E., Glendelvine, Dunkeld
1874 Fraser, James, C.E., Inverness	1861 Galloway, David, Cairnie, Glencorse
1874 Fraser, James, Mauld, Beaully	1859 Gangee, J., 1 Great Winchester Street Buildings, London, E.C.
1810 Fraser, John, London	1859 Garden, Arch., Grange-green, Forres
1865 Fraser, Capt. John, of Balnain, Fardraine, Stratherrick, Inverness	1874 Garden, Robert, North Ythsie, Tarves
1854 Fraser, Patrick Allan, of Hospitalfield, Arbroath	1857 Garden, William, Braco Park, Fraserburgh
1863 Fraser, Patrick, Sheriff of Renfrew and Bute	1857 Gardiner, George, Carrington Baras, Lasswade
1839 Fraser, Robert, Brackla, Nairn	1869 Gardiner, John, Cockburn, Balerno
1850 Fraser, W. S., Banker, Dornoch	1864 Gardiner, P., Rottearns, Braco, Perthshire
	1873 Gardiner, Patrick, Newbigging, Auchterarder
	1861 Gardiner, R., of Rottearns, Chapelbank, Auchterarder

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|---|---|
| Admitted | Admitted |
| 1859 Gardner, James, 58 George St., Edin. | 1875 Gibson, Jn., Sangskail, Rousay, Orkney |
| 1870 Gardner, John, 4 Abbotsford Place, Glasgow | 1875 Gibson, Robert, Auchenden, Strathblane |
| 1855 Gardner, Robert, Gattonside, Melrose | 1843 Gibson, Thomas, Haymount, Kelso |
| 1855 Gardner, Robt., City of Glasgow Bank, Whitburn | 1869 Gibson, Thomas, Bainfield, Fountain Bridge, Edinburgh |
| 1873 Gardner, Wm., Kepadwrie, Bucklyvie | 1869 Gibsone, Lieut-General, of Pentland, Red Cross Lodge, Leamington |
| 1867 Gardyne, Col. C. G., of Finhaven, Forfar | 1873 Giglioli, Italo, Florence— <i>Free Life Member</i> |
| 1851 Garland, Thomas, Ardlethen, Ellon | 1865 Gilchrist, Dugald, of Ospidale, Dornoch |
| 1825 Gartshore, John Murray, of Ravelston, Murrayfield, Edinburgh | 1877 Gilchrist, Andrew, Carvennom, Anstruther |
| 1864 Gartshore, John, Seedsman, Falkirk | 1876 Gilchrist, Andrew, Urie, Stonehaven |
| 1854 Gatherer, George, Solicitor, Elgin | 1873 Gilchrist, John, Todhill, Larbert |
| 1859 Gaukroger, G., Southfield, Longniddry | 1875 Gilchrist, William, Knivocklaw, Loudoun |
| 1837 Geekie, Alex., of Baldowrie, Coupar-Angus | 1842 Giles, James, Dresden |
| 1837 Geekie, Peter, Barclay Hill, Perth | 1848 Gilkison, Robert, jun., Glasgow |
| 1861 Geekie, Peter M., Cortachy, Kirriemuir | 1875 Gill, John, Blingery, Wick |
| 1871 Geekie, Robert, yr. of Baldowrie, Rosemount, Blairgowrie | 1854 Gillanders, J. F., of Highfield, Beaulieu |
| 1872 Geikie, Archibald, Professor of Geology, University of Edinburgh, Boroughfield House, Merchiston | 1836 Gillespie, Alex., Merchant, London |
| 1844 Geils, J. E., of Dumbuck, Hillhead, Dunkeld | 1871 Gillespie, Alex., Kirkton Barns, Ferryport-on-Craig |
| 1871 Gemmel, Andrew, Writer, Haddington, Secretary, United East Lothian Agricultural Society | 1841 Gillespie, David, of Mountquhannie, Cupar Fife |
| 1875 Gemmel, Andrew, Caplaw, Neilston | 1849 Gillespie, James, Craigie, Cramond |
| 1875 Gemmell, Gilbert C., Upper Whitehaugh, Muirkirk | 1860 Gillespie, James, Gateside, Douglas |
| 1875 Gemmell, John, Garpel, Muirkirk | 1875 Gillespie, James, St Colmes, Ballinluig |
| 1840 Gentle, Robert, Inverness | 1875 Gillespie, James John, Parkhall, Douglas |
| 1842 Gerard, Archd., of Rochsoles, Airdrie | 1847 Gillespie, John, W.S., 53 Northumberland Street, Edinburgh |
| 1873 Gerrard, John, Veterinary Infirmary, Market Deeping— <i>Free Life Member</i> | 1873 Gillespie, Rev. John, Mouswald Manse, Dumfries |
| 1871 Gibb, David, Lochty, Pittenweem | 1875 Gillespie, John, Land Steward, Minard, Inveraray |
| 1834 Gibbon, A., of Johnston, 6 Newbattle Terrace, Edinburgh | 1872 Gillies, Dr Hugh, Dunmore House, Easdale, Oban |
| 1869 Gibbons, Thomas, Burnfoot, Longtown | 1877 Gillies, William, Writer, Pollokshaws |
| 1849 Gibbs, B. T. Brandreth, 47 Half Moon Street, Piccadilly, London | 1862 Gillison, Thomas, 3 Dryden Road, Edge Lane, Liverpool |
| 1871 Gibson, Charles, Pitlochry | 1848 Gillon, Andw., of Wallhouse, Bathgate |
| 1875 Gibson, Francis, Woolmet, Dalkeith Glasgow | 1875 Gilmour, Alexander, Annfield House, Irvine |
| 1876 Gibson, Henry John, Fornety, Foveran | 1849 Gilmour, Allan, of Eaglesham, Glasgow |
| 1871 Gibson, James, 34 Abbotsford Place, | 1875 Gilmour, James, Orchardton, Cumnock |
| 1876 Gibson, James, Glenstocking, Dalbeattie | 1872 Gilmour, John, younger of Lundin, Montrave, Kennoway |
| 1863 Gibson, Jas., Merchiston Road, Edinburgh | 1863 Gilmour, John, of Mount Vernon, Row |
| 1864 Gibson, J., Gunsgreen Hill, Ayton | 1857 Gilmour, Matthew, Town of Inchinnan, Paisley |
| 1825 Gibson, John, W.S., 53 Inverleith Row, Edinburgh | 1828 Gilmour, W. J. Little, of Craigmillar, New Club, Edinburgh |
| 1828 Gibson, John, jun., W.S., 29 Greenhill Gardens, Edinburgh | 1853 Gilmour, W. M., Glasgow |
| 1853 Gibson, John, Toffcombs, Biggar | 1855 Girdwood, Robert, Tanfield, Edinburgh |
| 1860 Gibson, J. Tullowquhairn, Kirkbean, Dumfries | |

Admitted

- 1876 Gladstone, John Robert, yr. of Fasque, Laurencekirk
 1834 GLADSTONE, Sir Thomas, of Fasque, Bart., Laurencekirk
 1853 Gladstone, Thomas Stewart, of Capenoch, Thornhill
 1854⁺GLASGOW, Right Hon. the Earl of Crawford Priory, Cupar Fife
 1847 Glasgow, Alexander, of Old Court, Cork
 1874 Glasgow, R. Bruce Robertson, of Montgreenan, Kilwinning
 1857 Glegg, John, Factor, Milliken House, Johnstone
 1873 Glen, James, Rosebank, Luss
 1872 Glen, James, Stronafyne, Arrochar
 1847 Glen, John, late Merchant, Edinburgh
 1860 Glen, Robert R., Banker, Linlithgow
 1865 Glen, Robert C., Auchenbach, Barrhead
 1853 Glen, Thomas, Thornhill, Paisley
 1869 Glendinning, Alex., Hatton Mains, Ratho
 1849 Glendinning, Geo., Hatton Mains, Ratho
 1873 Glendinning, Geo. P., Dalmeny Park, Edinburgh
 1869 Glendinning, G. R., Hatton Mains, Ratho
 1874 Glendinning, James P., Rawfarm, Mid-Calder
 1848 Glendinning, Peter, Dalmeny Park, Edinburgh
 1859 Glover, Andrew, Lanrick Castle, Stirling
 1873 Goddard, H. R., Belsay, Newcastle-on-Tyne—*Free Life Member*
 1877 Goff, Dr Bruce, Woodlea, Bothwell
 1873 Gold, Joseph, Murthly Farm, Perth
 1865 Goldie, R. G. M., 3 Comely Green Place, Edinburgh
 1874 Goodbrand, Jas. H., Culnaha, Nigg, Ross-shire
 1851 Goodlet, William, Bolshan, Arbroath
 1875 Gordon, Adam Hay, of Mayen and Avochie, Huntly
 1876 Gordon, Alex. Morrison, of Newton, Insh, Aberdeen
 1875 Gordon, Arthur Newton Forbes, of Rayne, Pitcairne
 1866 Gordon, Chris., late Cammerie, Parton
 1873 Gordon, Carlos Pedro, of Wardhouse, Insh, Aberdeenshire
 1876 Gordon, Charles, of Hallmyre, Lamancha
 1860 Gordon, David A., of Culvennan, Greenlaw House, Castle-Douglas
 1840 GORDON of DRUMHEARN, Right Hon. Lord. 2 Randolph Crescent, Edinburgh

Admitted

- 1860 Gordon, G., Tullochallum, Dufftown
 1873 Gordon, Captain Geo. G., Miltown of Kilravock, Nairn
 1875 Gordon, Graham, Middlecote House, Ampert, Andover
 1855 Gordon, H. G., late Oriental Bank, London
 1860 Gordon, Henry, Sheriff-Clerk, Moatbrae, Dumfries
 1876 Gordon, Henry, of Manar, Inverurie
 1868 Gordon, Henry Wolrige, of Hallhead, Esselmont, Ellon
 1874 Gordon, James A., Udale, Invergordon
 1838 Gordon, John, of Aikenhead, Cathcart
 1870 Gordon, John, Culraven, Kirkeudbright
 1871 Gordon, John, of Craigmyle, Torphins
 1853 Gordon, John, Lettoch, Glenlivet, Ballindalloch
 1861 Gordon, John, of Cluny, Cluny Castle, Aberdeen
 1875 Gordon, John, Balmuchy, Fearn
 1831 Gordon, John Taylor, late of Nethermuir, New Deer
 1875 Gordon, Joseph C., of Drimmin, Morvern, Argyllshire
 1876 Gordon, Peter G., Nevie, Glenlivet, Ballindalloch
 1846 Gordon, Robert Macartney, of Rattrra, Ellenbank, Kirkeudbright
 1870 Gordon, Robt. Wm., Comlongan Mains, Annan
 1863 Gordon, Thomas Dempster, late of Balmaghie, Castle-Douglas
 1870 Gordon, Thomas, 11 Grosvenor Crescent, Edinburgh
 1847 Gordon, W. Cosmo, of Fyvie, Fyvie Castle, Aberdeen
 1875 Gordon, William, Auchallater, Braemar
 1876 Gordon, William, of Threave, Castle-Douglas
 1876 Gossip, William, Park, New Machar
 1866 Gough, Wm., Land Agent, Wykeham, York
 1871 Goulding, W., North Wall, Dublin
 1871 Gourlay, Robert Conning, Arbrack, Whithorn
 1851 Gow, John L., Raith, Kirkealdy
 1860 Gowans, James, Rockville, Napier Road, Edinburgh
 1868 Grame, Robert, of Garvoek, Perthshire
 1873 Graham, Alexander, Blackwater, Kilmaleohm
 1862 Graham, Carolus J. Home, 37 Melville Street, Edinburgh
 1869 Graham, George, Oakbank, Longtown
 1855 Graham, H., Auckland, New Zealand

Admitted	Admitted
1827 Graham, James (late of Leitchtown), 67 Shuter Street, Toronto	1876 Grant, George Smith, Auchorachan, Glenlivet
1848 Graham, James Maxtone, of Redgorton, Perth	1828 Grant, Rev. James, D.C.L., D.D., Chaplain to the Society, 15 Palmerston Place, Edinburgh
1851 Graham, James, Parcelstown, Longtown	1865 GRANT, Lieut.-Col. the Hon. James, of Grant, Invererne, Forres
1863 Graham, James, late of Southbar, Paisley	1871 Grant, John, Inverlaidnan, Carr Bridge
1864 Graham, James, Myothill, Denny	1876 Grant, John, Banker, Methlic
1874 Graham, John, 7 Old Smithhills Street, Paisley	1865 Grant, John, 57 South Guildry Street, Elgin
1852 Graham, John, of Shaw, Lockerbie	1853 Grant, Kenneth, late Kinellan, Dingwall
1842 Graham, John Murray, of Murrays-hall, Perth	1862 GRANT, Lieut.-Gen. Sir Patrick, G.C.B.
1865 Graham, Paul, of Drynie, 1 Carlisle Place, Victoria Street, London	1826 Grant, Robert, of Kincorth, Forres
1873 Graham, Robert G., Burnfoot-on-Esk, Longtown	1841 Grant, Robert, of Drumminor, Rhyne
1834 Graham, Col. William, of Mossknowe, Ecclefechan	1842 Grant, Robert, Bookseller, 107 Princes Street, Edinburgh
1854 Graham, Wm., of Devonshaw, Dollar	1846 Grant, Thos. Macpherson, of Craigo
1871 Graham, William, Easter Caputh, Dunkeld	1874 Grant, Major William, Drumbuie, Glen Urquhart, Inverness
1876 Graham, Wm., Wheatlands, Cramond Bridge	1862 Grant, William, Drumdelgie, Huntly
1870 Graham, William B., Unthank, Ewes, Langholm	1833 Grant, Wm., of Elchies, Craigellachie
1869 Graham, Wm. C., Broom House, Mearns	1839 Grant, William, Australia
1833 Graham, W. Stirling, of Airth, Larchert	1874 Grant, Colonel W. L., Borgia House, Farr, Thurso
1853 Grahame, Barron, of Morphie 30 Buckingham Terrace, Edinburgh	1829 Grassick, John, 21 Ferryhill Place, Aberdeen
1873 Grahame, James, of Auldhouse, Pollokshaws	1859 Gray, Alex., Tanlawhill, Langholm
1873 Granger, Andrew, Fettes, Inverness	1873 Gray, Andrew, West Plean, Stirling
1861 Granger, John, Pitcur, Coupar-Angus	1857 Gray, George, Windyyet, Falkirk
1872 GRANT, Sir Alex., Bart., Principal of the Edinburgh University, 21 Landsowne Crescent	1873 Gray, James, Birkenwood, Gargun-nock
1854 GRANT, Sir Archd., of Monymusk, Bart., Aberdeen	1861 Gray, J., Braehead Mains, Cramond
1872 Grant, A., Ardkinglas, Cairndow	1868 Gray, James, Craigs, Stirling
1862 Grant, Charles, Hazelbrae, Glen Urquhart	1871 Gray, James, Kirkton of Collace, Bal-beggie, Perth
1874 Grant, Charles T. C., of Kilgraston, Bridge of Earn	1871 Gray, John, Merchant, Helensburgh
1868 Grant, D. R. Lyall, of Kingsford, Aberdeen	1876 Gray, John, 15 Exchange Square, Glasgow
1875 Grant, Duncan J., Dundaleith, Craigellachie	1856 Gray, John, Engineer, Uddingston
1858 Grant, Francis William (Monymusk), 40 Pall Mall, London	1854 Gray, Patrick, Middle Strath, Falkirk
1869 Grant, Captain Frederick G. Forsyth, of Ecclesgreig, Montrose	1854 Gray, Thomas, Coul, Markinch
1876 Grant, George, Glenfarclass, Ballindalloch	1858 Gray, Thomas R., St Margarets, Cheltenham
1874 Grant, George, Pollo, Invergordon	1849 Gray, Wm., Southfield, Duddingston, Edinburgh
1859 GRANT, Sir George Macpherson, of Ballindalloch, Bart., Ballindalloch	1855 Gray, William, Brownrigg, North Berwick
	1874 Green, Robert, Ruthrie, Aberlour, Craigellachie
	1857 Green, William, Lynnburn, Aberlour, Craigellachie
	1873 Greenlees, Alex., Summerhill, Campbelltown
	1867 Greenshields, James, West Town, Lesmahagow
	1876 Greenshields, Thomas A., Stonehill, Crawfordjohn

Admitted

- 1854 Gregory, Alex. Allan, Corn Merchant, Inverness
 1833 Gregory, Arthur Thomas, late of Buchrombe, Dufftown
 1875 Gregory, John, Westoe, South Shields
 1871 Greig, David (John Fowler & Co.), Leeds
 1873 Greig, David, Muircote, Tillicoultry
 1868 Greig, George, Harvieston, Stonehaven
 1870 Greig, J. A., Terreglestown, Dumfries
 1873 Grey, James Booth, Secretary, Kincardineshire Farmers' Club, Laurencekirk
 1860 Greig, Peter M., 56 Inverleith Row, Edinburgh
 1852 Greig, Thomas, of Glencarse, Perth
 1861 Greig, T. Watson, 21 Palmerston Place, Edinburgh
 1854 Grey, Geo. A., Millfield Hill, Wooler
 1860 GRIERSON, Sir Alex. William, of Lagg, Bart., Rockhall, Mouswald, Dumfries
 1851 Grierson, J., Little Kirkland, Haugh of Urr, Dalbeattie
 1855 Grierson, James, of Dalgoner, Dunscore
 1860 Grierson, J., Lansdowne Villa, Kirkcudbright
 1859 Grierson, Jos., Breoch, Castle-Douglas
 1860 Grierson, Robert, West Mains, Mouswald, Dumfries
 1859 Grierson, Wm., Tors, Castle-Douglas
 1872 Grieve, Archd., Albyrigg, Canonbie
 1867 Grieve, D., Blackberry Hill, Whitburn
 1873 Grieve, James, Borthwickbrae Burnfoot, Hawick
 1872 Grieve, Jas., Branxholm Braes, Hawick
 1858 Grieve, John, Castles, Dalnally
 1869 Grieve, John, St James Hall, Regent Street, London
 1859 Grieve, Michael, Callander
 1857 Grieve, Robert, Auch, Tyndrum
 1857 Grieve, Robert, Edralaidach, Trossachs, Callander
 1861 Grieve, Walter, Skelthill, Hawick
 1851 Grieve, William, Skelthill, Hawick
 1858 Grigor, James D., Wester Alves, Forres
 1847 Grigor, John, Nurseries, Forres
 1871 Grimond, Alex. D., of Glenrieht, Blairgowrie
 1872 Guild, Andrew, Rhoders, Alva
 1868 Guild, James, Balzone Barns, North Berwick
 1871 Guild, James Lyon, Abbey, North Berwick
 1868 Guild, James Wyllie, C.A., Glasgow
 1856 Gulston, Alan Jas., of Dirlton, Llangadock, Carmarthenshire

Admitted

- 1858 Gunn, Alexander, Dale, Halkirk, Golspie
 1856 Gunn, Alexander, Dornoch
 1839 Gunn, James, Sibster, Wick
 1849 Gunn, Marcus, Culgower, Golspie
 1875 Gunn, Wm., Strathpeffer, Dingwall
 1874 Gunniss, Geo. Ponton, Leckie House, Stirling
 1854 Guthrie, David, Banker, Stranraer
 1836 Guthrie, John, of Guthrie, Forfar
 1857 Guthrie, Robert, Crossburn, Troon
 1874 Gwyer, Cecil F., Biallid, Kingussie
 1834 Gwynne, Alban Thomas Jones, of Monachty, Cardigan
 1857† HADDINGTON, Right Hon. the Earl of, Tynningham, Prestonkirk
 1857 Haddon, Andrew, Honeyburn, Hawick
 1854 Hadwen, S., Kildonan Lodge, Golspie
 1862 Hagart, Colonel, The Cleave, Torquay
 1871 Haggart, Peter, Keltneyburn, Aberfeldy
 1874 Haig, Archd. R., Quarryford, Gifford
 1869 Haig, Hugh V., Cameron House, Windygates
 1841 Haig, J., Cameron House, Windygates
 1874 Haig, James Richard, of Blairhill, Stirling
 1875 Haig, J. W., of Dollarfield, Dollar
 1869 Haig, W. H., Cameron House, Windygates
 1857 Haig, William (late North Street, St Andrews), Australia
 1861 Hain, David, Drumrack, Crail
 1871 Hain, Thomas, Carubee, Pittenweem
 1861 Haining, John, Boghead, Mouswald, Dumfries
 1870 Haining, J. J., Skipmyre, Lochmaben
 1859 Haldane, Robert, Fernielee, Galashiels
 1870 Halkett, David H., Banker, Alyth
 1864 Halkett, Jas., Auchenlander, Inch
 1864 Halkett, Lieut-Col. John Craigie, yr. of Craunod, Edinburgh
 1861 Hall, Alex., Rhynd, Leuchars, Fife
 1876 Hall, Alexander H., Campfield, Banchoory
 1873 Hall, Allan, Deiquick, Arduaddy, Easdale
 1855 Hall, Andrew, of Calrossie, Tain
 1874 Hall, George Ross, Invergordon
 1868 Hall, James, 33 Frederick Street, Aberdeen
 1875 Hall, James M., of Tangy and Killean, Killean House, Tayinloan
 1874 Hall, John, Tomich, Invergordon
 1877 Hall, Robert, Linton Cottage, Penicuik
 1877 Hall, William, Linton Cottage, Penicuik

Admitted	Admitted
1867 Hallen, J. H. B., M.R.C.S.E., Staff-Vet. Surgeon, H.M. Bombay Army	1859 Hamilton, Wm. F., Callendar Park, Falkirk
1868 Halley, George, New Mills, Culross	1872 Handyside, J. B., 49 Northumberland Street, Edinburgh
1870 Halley, John, Dornich Mills, Crieff	1875 Handyside, Thomas, The Glen, Musselburgh
1844 HALLIBURTON, Right Hon. Lord John, Halliburton House, Coupar-Angus	1843 Handyside, W., 11 Claremont Crescent, Edinburgh
1865 Halliday, Thomas, Rosehall Foundry, Haddington	1854 Hannan, J., The Terrace, Pocklington, Yorkshire
1865† HAMILTON & BRANDON, His Grace the Duke of	1872 Hannan, J. D., Dunse
1874 Hamilton, Alex., of Rozelle, Ayr, Commander R.N.	1858 Hannay, John, Gavenwood, Banff
1868 Hamilton, Claud Hamilton, Preston Hall, Dalkeith	1876 Hannay, Robert, of Hanley, Corstorphine
1861 Hamilton, Daniel, 66 Hutchison St., Glasgow	1871 Hardie, Chas., Primrose, Dunfermline
1875 Hamilton, Gavin, of Auldtown, Lesmahagow	1870 Hardie, David, Priestthaugh, Hawick
1869 Hamilton, George, Ardendee, Kirkeudbright	1875 Hardie, Edmund W., Locher House, Bridge of Weir
1876 Hamilton, George, Skene House, Skene, Aberdeen	1851 Hardie, George, Australia
1853 Hamilton, Hugh, of Pinmore, Girvan	1861 Hardie, Robert, Harrietfield, Kelso
1865 Hamilton, James, Wallace Bank, Kilmarnock	1863 Hardie, W. H., Bo'Mains, Linlithgow
1869 Hamilton, J. B. B. Baillie, of Arnprior, Cambusmore, Callander	1849 Hare, Stuart Bayley, of Calderhall, Mid-Calder
1869 Hamilton, James, Woolfords, Carnwath	1873 Harley, D., Hillwood Cottage, Ratho
1870 Hamilton, John, Conenish, Tyndrum	1853 Harper, Frank, Torgorm, Dingwall
1839 Hamilton, Lieut.-Col. John, of Sundrum, Ayr	1876 Harper, Frank Vogan, Bridgend, Linlithgow
1872 Hamilton, John, Banker, Lesmahagow	1867 Harper, Joseph, Snawdon, Gifford
1860 Hamilton, John, Longrig, Torthorwald	1876 Harper, Robert S., Edmonstone Mains, Liberton
1864 Hamilton, J., Monktonhill, Monkton, Ayr	1871 Harper, William, Dram Bank, Liberton
1875 Hamilton, John, Wellwood, Muirkirk	1864 Harris, Richard H., Earnhill, Forres
1846 Hamilton, John Buchanan, of Leny, Callander	1871 Harris, William, Cranley, Meikleour
1857 Hamilton, John G. Carter, of Dalzell, Motherwell	1867 Harris, William, Tirinie, Aberfeldy
1855 Hamilton, J. B. (late Burnhouse, Carnwath), London	1864 Harrison, George, 17 Whitehouse Terrace, Edinburgh
1870 HAMILTON, The Hon. R. B., M.P., Langton, Dunse	1846 Harrop, I. Worthington, New Zealand
1825† HAMILTON, Right Hon. R. C. Nisbet, Biel House, Prestonkirk	1869 Hart, J. Christine, Borrostone, Kin-cardine O'Neil
1871 Hamilton, Robt., Denmarkfield, Redgorton	1873 Hart, William, Kirklands, Auchterarder
1873 Hamilton, Robert, 30 St Andrew Square, Edinburgh	1846 Harvey, C. W., Watton-on-the-Hill, Liverpool
1871 Hamilton, William, Denmarkfield, Redgorton	1850 Harvey, George, Whittingham Mains, Prestonkirk
1864 Hamilton, William, of Cairns, Mid-Calder	1876 Harvey, George Thomson, Aberdeen Lime Co., Aberdeen
1874 Hamilton, William Cameron, Balta-sound, Unst	1854 Harvey, J. H., Pitgersie, Foveran, Ellon
	1809 Harvey, J., of Tiningly Park, Yorkshire
	1852 Harvie, Rev. W., of Brownlee, Carluke
	1860 Hathorn, John Fletcher, of Castlewigg, Whithorn
	1873 Hawley, William, 27 Frederick Street, Edinburgh

Admitted

- 1875 Haughton, Wm. Hoghton, Factor,
Craigowan, Kilmarnock
- 1875 Hay, Alexander, Gifford Vale, Gifford
- 1864 Hay, Alexander, Trochelhill, Fochabers
- 1870 Hay, Alexander, Easter Cultmalundie,
Perth
- 1874 Hay, Alexr. Penrose, Riverdale, Inverness
- 1862 Hay, Col. A. S. Leith, of Rannes, C.P.,
Leith Hall, Kennethmont
- 1865 Hay, C., Ardbeg, Islay, Greenock
- 1862 Hay, Colonel Drummond, of Seggieden, Perth
- 1841 Hay, Geo. W. (of Whiterigg), Sudbury
- 1862 Hay, Captain J. G., of Belton, Dunbar
- 1862 Hay, James (late Scrabster, Thurso),
Edinburgh
- 1828 Hay, James, Links, Leith
- 1858 Hay, James, jun., Little Ythsie, Tarves
- 1855 Hay, J., Nether Mill, Tarves
- 1848 HAY, Sir John C. Dalrymple, of Park
Place, Bart., M.P., Glenluce
- 1867 HAY, Sir Robert, of Haystoun, Bart.,
Kingsmeadows, Peebles
- 1846 Hay, Samuel, 13 Grosvenor Crescent,
Edinburgh
- 1869 Hay, William, 17 Hill Street, Edinburgh
- 1876 Hayman, John, Dumfries House Mains,
Cumnock
- 1872 Hazle, Alex., of Blackeraig, Drum-
burlie House, Maybole
- 1857 Hebden, Robt. J., of Eday, Kirkwall
- 1876 Hector, Andrew Edward, Collyhill,
Inverurie
- 1871 Heggie, Henry, Mains of Beath, Cross-
gates
- 1871 Heggie, Robt. B., West End House,
Kirkcaldy
- 1877 Hoggie, William, East Pitkeirie,
Anstruther
- 1871 Holton, Andrew, of Darnick Tower,
Perth
- 1869 Henderson, Adam, Grange, Dumfer-
mline
- 1876 Henderson, Alexander, Dunkenny,
Glamis
- 1837 Henderson, Alexander, Longniddry
- 1847 Henderson, Alex., of Stenister, Thurso
- 1876 Henderson, A. G., Greenisle Row,
Edinburgh
- 1873 Henderson, A. W., Airthrey Paper
Mills, Bridge of Allan
- 1874 Henderson, A. W., yr. of Bilsater,
Wick
- 1847 Henderson, Charles J., 39 Royal Ter.,
Edinburgh
- 1854 Henderson, David, of Abbotside, Bon-
chester Bridge

Admitted

- 1860 Henderson, George, Garroch, Dumfries
- 1839 Henderson, James, of Bilbster, Wick
- 1863 Henderson, Jas., Mintokaims, Hawick
- 1860 Henderson, Jas., Kelloside, Sanquhar
- 1839 Henderson, J., W.S., Banker, Thurso
- 1850 Henderson, John, Byres, Haddington
- 1876 Henderson, John, Courtestown, Leslie,
Insch, Aberdeen
- 1859 Henderson, John, Humbie Mains,
Blackshiels
- 1877 Henderson, John, Longniddry, East
Lothian
- 1874 Henderson, Richard, Coldstream—*Free
Life Member*
- 1858 Henderson, Robt., late Lornshill,
Alloa
- 1854 Henderson, Thomas, Pogie House,
Upper Keith
- 1861 Henderson, W., Milntown, Coupar-
Angus
- 1868 Henderson, William, Redbog, Mintlaw
- 1862 Hendrie, John, of Larbert, Stirling-
shire
- 1865 Hendrie, J., Castle Heather, Inver-
ness
- 1874 Henry, John, S.S.C., 29 Rutland
Square, Edinburgh
- 1863 Hepburn, J., Preston Mains, Preston-
kirk
- 1876 Hepburn, James, Spittal, Keithhall,
Inverurie
- 1877 Hepburn, John, Pitcairn, Lochgelly
- 1837 HEPBURN, Sir Thos. Buchan, of Smea-
ton, Bart., Prestonkirk
- 1876 Herdman, Benjamin A., Falkland
Wood, Falkland
- 1851 Heriot, F. L. Maitland, of Ramornie,
Ladybank, Sheriff of Forfar
- 1853 Herries, Alex. Young, of Spottes, 16
Heriot Row, Edinburgh
- 1857 Hewat, Richard, Writer, Castle-Douglas
- 1862 Heweston, J., Auchenbainzie, Thorn-
hill
- 1870 Heweston, Joseph, Balgonie, Newton-
Stewart
- 1870 Hiddleston, John, Braclaw, Dal-
swinton, Dumfries
- 1863 Higgins, Robert, Newwar, Preston-
kirk
- 1868 Hight, Robert, Merchant, Garliestown
- 1864 Hill, Abner, of Stonywynd, Barhill,
St Andrews
- 1873 Hill, Arthur James, Accountant, Moor-
gate St., London—*Free Life Member*
- 1823 Hill, George Cassel, Merchant, London
- 1847 Hill, James, Lawson, W.S., 26 Heriot
Row, Edinburgh
- 1861 Hill, James, Bradston, Meikle
- 1850 Hill, John, Carlowie, Craigmund Bridge
- 1868 Hill, John, Whitehill, Lasswade

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|---|---|
| Admitted | Admitted |
| 1851 Hill, Robert, Navidale Ho., Helmsdale | 1847 Hope, James, Duddingston, Edinburgh |
| 1874 Hill, Robert Robertson, Navidale House, Helmsdale | 1872 Hope, James L. A., Hopetoun House, South Queensferry |
| 1863 Hilson, George, jun., Solicitor, Jedburgh | 1848 Hope, J., of Belmont, W.S., 42 Charlotte Square, Edinburgh |
| 1860 Hilton, Henry, of Fairgirth, Dalbeattie | 1859 Hope, Wm., Leith |
| 1875 Hindmarsh, Charles, Land Agent, 17 Bridge Street, Workington | 1871 Horn, John, of Thomanean, Milnathort |
| 1869 Hislop, John, Goatfield, Haddington | 1851 Horn, Robert, Advocate, Edinburgh |
| 1854 Hislop, Robert, jun., Prestonpans | 1864 Horncastle, Henry, Whitemoor, Ollerton, Newark |
| 1862 Hobkirk, James, Broadhaugh, Hawick | 1851 Horne, T. E. O., W.S., 19 Grosvenor Street, Edinburgh |
| 1860 Hog, Thomas A., of Newliston, Kirkliston | 1858 Hornsby, Richard, Spittlegate Iron Works, Grantham |
| 1863 Hogarth, George, Warren, Salisbury | 1841 Horsburgh, R., 29 Grange Road, Edinburgh |
| 1842 Hogarth, George, Banker, Cupar-Fife | 1853 Hosack, William, Barcaldine, Taynuilt |
| 1873 Hogarth, Robert, Heiton Mills, Kelso | 1865 Hosack, John, Dochcarty, Dingwall |
| 1863 Hogg, Henry, Symington Mains, Stow | 1865 Houldsworth, Henry, jun., Glasgow |
| 1876 Hogg, Robert, 92 Gilmore Place, Edinburgh | 1868 Houldsworth, J., of Coltness, Wishaw |
| 1859 Hogg, Robert, Rosemay, Leadburn | 1865 Houldsworth, J. M., Carrick House, Ayr |
| 1854 Hogg, Thomas, Hope Park, Hillhouse, Coldstream | 1857 Houldsworth, Joseph Henry, Glasgow |
| 1875 Holm, John, Jaapston, Neilston | 1872 Houldsworth, Walter J., Coltness House, Wishaw |
| 1873 Holliday, Jonathan, Waver Terrace, Abbey Town, Carlisle | 1857 Houldsworth, William, Glasgow |
| 1874 Holst, Christian, Chamberlain to His Majesty Oscar II., and Norwegian Court Paymaster— <i>Honorary Associate</i> | 1875 Houstoun, George L., of Johnstone, Johnstone, Renfrewshire |
| 1843+HOME, Right Hon. the Earl of, The Hirsel, Coldstream | 1877 Houstoun, Michael Henry, Upper Bonnytown, Linlithgow |
| 1836 Home, David Milne, of Milnegraden, Coldstream | 1873 Houstoun, Robert A., of Clerkington, Haddington |
| 1874 Home, David Milne, of Wedderburn, M.P., 38 Queensgate Terrace, London | 1854 Houstoun, Wm., Kintradwell, Golspie |
| 1829 Home, Francis, Bellsyde, Linlithgow | 1859 Howard, James (J. & F. Howard), Bedford |
| 1831 Home, G. H. M. Binning, of Argaty, Doune | 1865 Howatson, Charles, of Dornel, Dalgorch House, Mauchline |
| 1857 Honeyman, John, Laughton Lodge, Hawklurst, Sussex | 1875 Howatson, John L., Becks, Langholm |
| 1858 Hood, Archibald, Rosewell, Lasswade | 1876 Howatson, W. M. S., Cronberry, Cumnock |
| 1857 Hood, James, (late Newmains, Prestonkirk), Australia | 1865 Howden, John, late Seedsman, Inverness |
| 1827 Hood, John, of Stoneridge, Coldstream | 1864 Howden, John, Overseer, Nether Braco, Perthshire |
| 1859 Hood, John, Townhead, Cockburnspath | 1850 Howden, Robert, Boggs, Pencaitland |
| 1875 Hood, Robert, of Sunnyside, M.D., 5 Salisbury Road, Edinburgh | 1854 Howe, Alexander, W.S., 17 Moray Place, Edinburgh |
| 1854 Hood, T., Coldstream Mains, Coldstream | 1863 Howie, H. Brown, North Hazelrigg, Belford, Northumberland |
| 1869 Hope, Alex. P., of Bordlands, Oxwell Mains, Dunbar | 1863 Howie, James, Haddon, Kelso |
| 1851 Hope, Andrew (late Edinburgh), Ireland | 1857 Howie, John, Hurlford, Kilmarnock |
| 1832 HOPE, Sir Archibald, of Pinkie, Bart., Musselburgh | 1855 Hoyle, Duncan, London |
| 1877 HOPE, Hon., Charles, of Bridge Castle, Bathgate | 1822 Hozier, J., of Mauldslie Castle, Carlisle |
| 1865 Hope, Henry W., of Luffness, Drem | 1862 Hozier, W. W., of Tannoehside, Bells-hill, Glasgow |
| 1868 HOPE, Admiral Sir James, of Carriden, G.C.B., Bo'ness | 1853 Hubbach, Joseph, Liverpool |
| | 1865 Hudspith, Wm., Brookside, Haltwhistle |
| | 1844 Huggins, W. B., Glasgow |

Admitted

- 1860 Hughan, Peter, Cults, Whithorn
 1838 Hughan, Thomas, of Airs
 1872 Hughes, Geo. P., of Middleton Hall, Wooler
 1875 Hugonin, R., Kinmylies House, Inverness
 1857 Huie, James, Durry, Campbeltown
 1869 Hume, Archibald, of Auchendolly, Dalbeattie
 1871 Hume, George T., Sunlawhill, Kelso
 1869 Hume, John, Balmirmer, Arbroath
 1818 Hume, M. N. Macdonald, W.S., 15 Abercromby Place, Edinburgh
 1840 Hume, P. Hallyburton, Lawfield, Cockburnspath
 1859 Hunt, James Alex., of Pittencrieff, Logie, Dunfermline
 1855 Hunter, Alex., Nethershiel, Ratho
 1876 Hunter, Capt. Alexander C., of Tillery and Aucheries, Aberdeen
 1826 Hunter, David, of Blackness, Dundee
 1867 Hunter, David, Gultreehill, Maybole
 1860 Hunter, Evan Alan, W.S., 121 Princes Street, Edinburgh
 1861 Hunter, Herbt., of Burnhead, Lockerbie
 1876 Hunter, James, of Antonshill, Coldstream
 1867 Hunter, James, Coplawhill, Strathbungo, Glasgow
 1852 Hunter, James, of Glenapp, Newmains House, Newmains
 1873 Hunter, James (of Pilloor, Neilgherry Hills, Madras), 1 Doune Terrace, Edinburgh
 1842 Hunter, J. Wm., of Thurston, Dunbar
 1876 Hunter, John, Confunderland, Leochel-Cushnie
 1864 Hunter, John, Dipple, Fochabers
 1875 Hunter, John, Nethershiel, Mid Calder
 1877 Hunter, John, Jun., Woodhall Mains, Juniper Green
 1871 Hunter, Patrick, Argaith, Perth
 1837 Hunter, Richard, 10 Ainslie Place, Edinburgh
 1862 Hunter, Robt., 10 Ainslie Place, Edinburgh
 1869 Hunter, William, Craighead, Abington
 1870 Hunter, William, Crawfordton Lodge, Montaive
 1853 Hunter, William B., Haugh, Kirklinton
 1857 Hunter, William, Machribeg, Campbeltown
 1877 Hunter, William Frederick, of Hafton, Advocate, 1 Ainslie Place, Edinburgh
 1850 Huntly, R. Hodgson, of Carham Hall, Coldstream

Admitted

- 1872 HUNTLY, Most Noble the Marquis of, Aboyne Castle, Aboyne
 1876 Hurl, John, Cardowan Brickworks, Moodiesburn
 1859 Husband, Robert, Gellet, Dunfermline
 1838 Hutchinson, Jas., Merchant, Glasgow
 1857 Hutchinson, James, Mouswald Farm, Terrace, Dumfries
 1872 Hutchison, James Thomas, 28 Royal Edinburgh
 1872 Hutchison, J. H., Manor House, Catterick
 1871 Hutchison, Robt., Merchiston Avenue, Edinburgh
 1829 Hutchison, R., of Cairngall, Longside
 1859 Hutchison, Robt., Braehead, Kirkealdy
 1858 Hutchison, R., of Carlowrie, 29 Chester Street, Edinburgh
 1875 Hutchison, Thomas, Bellfield, Duddingston
 1870 Hutchison Thos., Broomhill, Loanhead
 1868 Hutton, Arthur, Comlongan Castle, Annan
 1859 Hyndman, Henry C., of Springside, West Kilbride
 1870 Hyslop, And., Auchenreoch, Dalbeattie
 1857 Hyslop, H. D. B., Tower, Saunquhar
 1870 Hyslop, John, of Bank, New Cumnock
 1873 Imrie, John L., Blackhill, Maryhill, Glasgow
 1869 Inch, James G., Mitchellhill, Biggar
 1855 Inch, John, West Mains, Liberton
 1870 Inch, Thos., Gilkerseuch, Abington
 1869 Inglis, Alex. Wood, jr. of Glencorse, 30 Abercromby Place, Edinburgh
 1834 Inglis, Charles Craigie Halkett, of Craunod
 1874 Inglis, David, Flemington, Lerwick
 1864 Inglis, George, Dron, Cupar Fife
 1847 Inglis, Harry Maxwell, of Loganbank, P.C.S., 11 Coates Crescent, Edinburgh
 1849 Inglis, Henry, of Torsonee, W.S., 1 Great Stuart Street, Edinburgh
 1856 Inglis, Lieut.-Col. Hugh, of Kingsmills, Inverness
 1852 INGLIS, Right Hon. John, of Glencorse, Lord Justice-General, 30 Abercromby Place, Edinburgh
 1860 Inglis, John, Stram Mills, Leith
 1857 Inglis, John, of Redhall, Slatford
 1864 Inglis, John, Kephlaroch, Gargunnoch
 1865 Inglis, Peter, East Pilton, Ferry Road, Edinburgh
 1877 Inglis, Robt., Lovestone House, Girvan
 1872 Inglis, Wm., Prenderguest, Aytou
 1857 Inkson, Patrick, Berryleys, Keith
 1876 Inkson, Thomas F., Kinermory, Craigellachie

Admitted

- 1840 Innes, Alex., of Raemoir, Banchory
 1842 Innes, Alexander Mitchell, of Ayton
 1874 Innes, Charles, Solicitor, Inverness
 1865 Innes, Frederick S. Bentley, of Thrumster, Golspie
 1865 Innes, William Mitchell, yr. of Ayton.
 1847 Innes, George Mitchell, of Bangour, 32 Buckingham Terrace, Edinburgh
 1838 INNES, Sir J. Milne, of Edingight, Bart., Keith
 1847 Innes, John B., W.S., 11 Moray Place, Edinburgh
 1846 Innes, Col. Thomas, of Learney, Torphins
 1842 Innes, Thos. S. Mitchell, of Phantassie, Prestonkirk
 1862 Innes, T. G. Rose, of Netherdale, Turriff
 1876 Innes, William, Meikle Clinterty, Newhills, Blackburn, Aberdeen
 1876 INVERURIE, Right Hon. Lord, Inglismaldie Castle, Laurencekirk
 1858 Ironside, John, Brindy, Keig, Whitehouse, Aberdeen
 1859 Ironside, William, Clofrickford, Ellon
 1845 Irvine, Alex. Forbes, of Drum, Sheriff of Argyll, 25 Castle Terrace, Edinburgh
 1873 Irvine, George Forbes, Nigg, Ross-shire
 1869 Irvine, Walter, Grangemuir, Pittenweem
 1843 Irvine, Wm. Stewart, M.D., Craigatin, Pitlochry
 1870 Irvine, Benj., Barndennoch, Auldgirith, Dumfries
 1870 Irving, Chris., Blackearn, Castle Douglas
 1870 Irving, John, Boreland, Dunscore, Dumfries
 1838 Irving, John, London
 1869 Irving, J. Bell, of Whitehill, Lockerbie
 1872 Irving, Sam., Carco, Kirkeconnel, Sanquhar
 1871 Jack, Alexander, Agricultural Implement Maker, Maybole
 1872 Jack, Gavin, North Gyle, Forth-croft
 1864 Jack, John S., Cambusdrennie, Stirling
 1863 Jack, M., Peggy's Mill, Cramond Bridge
 1860 Jack, Samuel, Mersington, Coldstream
 1855 Jack, Robert, Banker, Motherwell
 1869 Jack, Thos., Riccarton Mains, Currie
 1863 Jackson, Edward J. (of the Priory, St Andrews), 6 Coates Crescent, Edinburgh
 1850 Jackson, John, of Amisfield, Dumfries

Admitted

- 1870 Jackson, John, Bush, Ewes, Langholm
 1876 Jaffray, Arthur, Banks, Fyvie
 1876 Jaffray, James, Belmont, Unst
 1852 Jameson, Melville, Solicitor, Perth
 1869 Jamieson, Alexander, C.A., 8 South Charlotte Street, Edinburgh
 1858 Jamieson, David, Auchmithie Mains, Arbroath
 1876 Jamieson, George, Lord Provost of Aberdeen
 1860 Jamieson, George Auldjo, C.A., 58 Melville Street, Edinburgh
 1874 Jamieson, James Auldjo, W.S., 14 Buckingham Terrace, Edinburgh
 1857 Jamieson, James Fyfe, Rednock House, Stirling
 1860 Jamieson, Jn. of Kingask, St Andrews
 1865 Jamieson, Michael J., of Arngomery, Kippen, Stirling
 1874 Jamieson, Robert J., S.S.C., Borrowstounness
 1871 Jamieson, Thomas, High Curghie, Drumore, Stranraer
 1876 Jamieson, Thomas F., Mains of Water-ton, Ellon
 1875 Jamieson, William, of Shandon, Row
 1876 Jamieson, William T., Solicitor, Anstruther
 1858 Jamieson, Wm. H., Mayshade, Loanhead
 1850 JARDINE, Sir Alexander, of Applegarth, Bart., Jardine Hall, Lockerbie
 1846 Jardine, Andrew, of Lanrick, Stirling
 1873 Jardine, Andrew, Ballemenoch, Row
 1846 Jardine, James, of Larriston, Dryfeholm, Lockerbie
 1854 Jardine, John, of Thorlieshope Arkleton, Langholm
 1863 Jardine, Robert, of Castlemilk, Lockerbie
 1870 Jefferson, Robt., Preston Hows, Whitehaven
 1857 Jeffrey, John, Cardowan House, Millerston, Glasgow
 1859 Jeffrey, John, of Balsusney, Kirkcaldy
 1869 Jeffrey, David, 14 Randolph Crescent, Edinburgh
 1873 Jenkinson, A., 10 Princes Street, Edinburgh
 1855 Jobson, William, Buteland, Bellingham, Northumberland
 1872 Johnson, W. H., Ramrig, Ladykirk, Berwickshire
 1836 Johnston, Alexander, W.S., Johnston, Rubislaw, Aberdeen
 1852 Johnston, Alexander, Hailes, Slateford
 1872 Johnston, Donald, Kilbride, Easdale, Oban

- Admitted
 1857 Johnston, G., M.D., Fincaigs, Newport
 1853 Johnston, George, Marlefield, Kelso
 1872 Johnston, George, Aquhorthies, Inverurie
 1860 Johnston, James, Banker, Dumfries
 1857 Johnston, James, Huntington, Lauder
 1876 Johnston, Jas., Pather Farm, Wishaw
 1871 Johnston, James, Cattle-dealer, Perth
 1856 Johnston, John, Banker, Bathgate
 1853 Johnston, J. S., Craillinghall, Jedburgh
 1839 Johnston, Robert, Beechwood, Laureneekirk
 1860 Johnston, Lieut.-Gen., of Carnsalloch, Castle-Douglas
 1871 Johnston, Stewart J., Cattle Dealer, Perth
 1859 Johnston, Thomas, Lochhouse, Moffat
 1848 Johnston, Sir William, of Kirkkhill, Gorebridge
 1852 Johnston, William, Writer, Bathgate
 1876 Johnston, William, Mill of Haulkerton, Laureneekirk
 1857 Johnston Wm., Ranachan, Campbelltown
 1850 Johnstone, Christopher, Dinwoodie Lodge, Lockerbie
 1842 JOHNSTONE, Hon. Henry Butler, of Corehead, Auchen Castle, Moffat
 1828 Johnstone, James, of Alva, Stirling
 1873 Johnstone, James, Hunterheck, Moffat
 1876 Johnstone, John, Drumwhindle Mains, Ellon
 1873 Johnstone, John, of Halleaths, Lockerbie
 1869 Johnstone, John, Kingledoors, Biggar
 1875 Johnstone, John, Auchcairnle, Laureneekirk
 1859 Johnstone, John A., Arehbank, Moffat
 1870 Johnstone, John Jas. Hope, of Annandale, M.P., Raehills, Moffat
 1859 JOHNSTONE, Admiral Sir Wm. J. Hope, K.C.B., 24 Albany Street, Edinburgh
 1865 Johnstone, Miss Hope, of Annandale, Marchbank Wood, Moffat
 1859 Johnstone, Robert, Polnoodie, Moffat
 1859 Johnstone, Walter, Alton, Moffat
 1874 Johnstone, W. M., National Bank of Scotland, Cupar-Fife
 1829 Jolly, David Leitch, Banker, Perth
 1862 Jones, Charles Digby, late Kilchamaig, Whitehouse, Kintyre
 1858 Jopp, Robert, New Zealand
 1865 Joss, Alexander, Cruchie, Huntly
 1865 Joss, John, Badgate, Cawdor, Nairn
 1873 Jukes, R. F., Cotwall, Wellington, Salop—*Free Life Member.*
 1858 Kay, Charles, Glenburgie, Forres
- Admitted
 1875 Kay, Charles, Mill Farm, Gargunnoch
 1871 Kay, Duncan James, of Drumpark, Dumfries
 1864 Kay, James, Hillhead, Gargunnoch
 1863 Kay, John, Softlaw, Kelso
 1872 Kay, John, jun., Softlaw, Kelso
 1867 Kay, Robert, Tuns, Minard, Inveraray
 1871 Kay, Robert, Linton Bankhead, Kelso
 1863 Kay, Wm., Broomieknowe, Lasswade
 1863 Kay, William, Little Kerse, Kippen, Stirling
 1844 Keir, Andrew T., Swinhoe, Chathill
 1864 Keir, Duncan, Buchlyvie, Stirling
 1837 Keir, Patrick Small, of Kindrogan, Pitlochry
 1857 Keir, Simon, Conservative Club, London
 1859 Keir, William, of Whithaugh, Newcastleton
 1867 Keir, William A., yr. of Kindrogan, Pitlochry
 1876 Keith, Alexander, Chapelton, Ellon
 1876 Keith, James, Newton of Kimmundy, Mintlaw
 1865 Keith, Peter, Factor, Barogill Castle, Wick
 1872 Kellie, John B., Ladywell, Dunse
 1874 Kelman, William, Balnagore, Fearn, Ross-shire
 1876 Kemp, Charles, Reclatieh, Glenrinnies, Dufftown
 1852 Kemp, Jn., Agricultural Implement Maker, Stirling
 1863 Kennedy, David, Newlands, Dumfries
 1866 Kennedy, Duncan C., of Glenstriven, Innellan
 1865 Kennedy, Henry H., Rossie Castle, Montrose
 1859 Kennedy, Jas., of Sundaywell, Brandleys, Sanquhar
 1874 Kennedy, John, Forester, Balmacraan Glen Urquhart
 1871 Kennedy, John, Royal George Hotel, Perth
 1846 Kennedy, John Lawson, of Knocknaling, Dalry
 1870 Kennedy, Robert, of Dalmakerran, Tynron, Thornhill
 1812 KENNEDY, Rt. Hon. T. F., of Dumure, Ayr
 1872 Kennedy, Thos., Coachbuilder, Kelso
 1875 Kennedy, William, 89 Marine Parade, Brighton—*Free Life Member.*
 1842 Kennedy, Wm., Commission Agent, Glasgow
 1862 Kennedy, Wm., W.S., 59 Northumberland Street, Edinburgh
 1870 Kennedy, Wm., Kirkland, Sanquhar
 1874 Kennedy, William, Sherramore, Kinnessie

- Admitted
 1860 Kennoway, Robt., Burnhead, Lass-
 wade
 1863 Ker, E. Martin, (late of Gateshaw,
 Morebattle, Kelso), London
 1854 Ker, Robert, of Douglaston, Milngavie
 1864 Kerr, Abram, Castlehill, Durrisdeer,
 Thornhill
 1869 Kerr, James, Lochend, Kilbirnie
 1853 Kerr, John, Land-Surveyor, Dunse
 1859 Kerr, John, Broomhouse, Corstorphine
 1860 Kerr, John, Greunan, New Galloway
 1875 Kerr, John, Elizafield, Dumfries
 1875 Kerr, John, Kinnoull, Perth
 1875 Kerr, John Graham, Illieston, Brox-
 burn
 1870 Kerr, Jos., Flatts of Cargen, Dumfries
 1857 Kerr, Robt., of Chapeldonan, Edin-
 burgh
 1860 Kerr, Thomas, Whitehill, Sanquhar
 1845 Kerr, William Williamson, late Oriel
 College, Oxford
 1875 Kerr, William, Newhouse, Dalry
 1833 Kerr, W. S., of Chatto, Sunlaws,
 Kelso
 1865 Kidd, Alexander F., East High Street,
 Airdrie
 1874 Kidd, Hugh, V.S., Inverness
 1858 Kidd, J., Balmirmer, Carnoustie
 1869 Kidd, Walter, Balleny, Currie
 1859 Kidston, Jn. P. (of Newton, Cambus-
 lang), 81 Great Clyde Street, Glas-
 gow
 1875 Kidston, Richard, 81 Great Clyde
 Street, Glasgow
 1864 Kier, Thomas, Newlands, Falkirk
 1876 Kilgour, Robert, junior, Ardlin,
 Ellon
 1826 Kilgour, Robert, jun., late Millbank,
 Aberdeen
 1862 Kilpatrick, P., Staneliffe, Matlock,
 Bath
 1868 King, Charles M., Antermony House,
 Milton of Campsie
 1864 King, David, Roseneath
 1873 King, Duncan, Kildean, Stirling
 1857 King, James, of Levernholm, 12 Clare-
 mont Terrace, Glasgow
 1872 King, James, West Mills, Colinton
 1839 King, Jas. F., 5 Richmond St., Glas-
 gow
 1871 King, J. Falconar, Analytical Chemist,
 18 Brown Square, Edinburgh
 1869 King, Robert, Levernholm, Hurlat
 1873 King, William, jun., Earn, Doune
 1839 King, William, Manufacturer, Glasgow
 1868 King, Lieut.-Colonel Wm. Ross, of
 Tertowie, Kinellar, Aberdeen
 1859 Kininmonth, Peter, Milton, Leuchars
 1859 Kinloch, Alexander, yr. of Gilmerton,
 Dorn
- Admitted
 1841 Kinloch, Alexander John, of Park,
 Aberdeen
 1828 KINLOCH, Sir David, of Gilmerton,
 Bart., Drem
 1825 KINLOCH, Sir George, of Kinloch, Bart.,
 32 Drummond Place, Edinburgh
 1829 Kinloch, Col. John Grant, of Kilrie,
 Logie, Kirriemuir
 1830† KINNSAIRD, Right Hon. Lord, K.T.,
 Rossie Priory, Inchture
 1862 KINNSAIRD, Hon. Arthur, M.P., 1 Pall
 Mall East, London
 1873 Kinnear, Arthur W., Stonehaven
 1876 Kinnear, C. G. H., of Drum, 12 Gros-
 venor Crescent, Edinburgh
 1853 KINNOUL, Right Hon. the Earl of,
 Dupplin Castle, Perth
 1873 Kinross, Andrew, Hungryhill, Dun-
 blane
 1876 Kinross, James, Coldstream, Lau-
 rencekirck
 1894 Kinross, J., Gannochan, Braco, Perth-
 shire
 1871 Kinross, Thomas, Loig, Braco, Perth-
 shire
 1850† KINTORE, Right Hon. the Earl of,
 Keith Hall, Inverurie
 1875 Kippen, Durham, of Busby, Glasgow
 1848 Kirk, John, W.S., 12 Claremont Cres-
 cent, Edinburgh
 1861 Kirk, James, Kaimknow, Muckhart
 1874 Kirkland, Major-General John Agmon-
 disham Vesey, of Wester Fordel,
 Milnathort
 1875 Kirkness, John, Quooyosty, Rousay,
 Orkney
 1868 Kirkpatrick, A., of Allanshaw, Hamil-
 ton
 1875 Kirkpatrick David, Linns, Torthor-
 wald
 1876 Kirkpatrick, James, Redhills, Torthor-
 wald
 1860 Kirkpatrick, Samuel, West Roucan,
 Dumfries
 1866 Kirkwood, Alex., Medalist to the
 Society, 9 St James Square, Edin-
 burgh
 1871 Kirkwood, Allan, Killermont, Mary-
 hill, Glasgow
 1854 Kirkwood, Hugh, Killermont, Mary-
 hill, Glasgow
 1867 Knight, Wm. Gray, of Jordanstone,
 Meigle
 1858 Knowles, Thomas, Flesher, Aberdeen
 1871 Knox, George, Polnoon Lodge, Eagles-
 ham
 1874 Knox, Robert, Woodside, Cambus,
 Alloa
 1869 Kynoch, George, jun., Isla Bank Mills,
 Keith

Admitted
 1872 Kynoch, Patrick, M.D., Greenlaw, Berwickshire
 1870 La Cour, L. W., Vice-Consul of Denmark, 17 Inverleith Row, Edinburgh
 1863 Laidlay, J. W., of Sealcliff, North Berwick
 1863 Laing, George, Wark, Coldstream
 1856 Laing, John, Newburgh, Fife
 1855 Laing, Thomas, 17 Palmerston Road, Edinburgh
 1874 Laing, William, Skaill, Thurso
 1858 Laird, Geo. W., of Denfield, Arbroath
 1871 Lamont, Charles, of East Bank, Kinross
 1850 Lamont, Jas., of Knockdow, Greenock
 1866 Lamont, Jn., 12 Henderson Row, Edinburgh
 1854 L'Amy, John Ramsay, of Dunkenny, Netherbyres, Ayton
 1857 Landale, James, Woodmill, Auchtermuchty
 1877 Landale, James, Junior, Woodmill, Auchtermuchty
 1874 Landale, John, of Woodbank, Banker, Dunfermline
 1855 Landale, Thomas, 4 Mayfield Terrace, Edinburgh
 1867 Lang, Alex., Borthrickfield, Bridge of Weir
 1875 Lang, Alex., Garneyland, Paisley
 1849 Lang, Hugh M., of Broadmeadows, Kirk
 1864 Lang, John, Bield, Gargunnoch
 1854 Lang, William, Glengorn, Tobermory
 1854 Langlands, James C., Bewick, Alnwick
 1857 Latham, Patrick R., The Kames, Laurick Castle, Stirling
 1864 Latta, Mat. Roger, Carnyle, Tollcross, Glasgow
 1873 Latta, William, Darmalloch, Cumnock
 1868 Lauder, Alex., Goshen, Musselburgh
 1859 Lauder, Dewar, St Nicholas, St Andrews
 1873 Lauder, William, Locherlour, Crieff
 1863 LAUDESDALE, Right Hon. the Earl of, Thirlestane Castle, Lauder
 1872 Laurie, John W., Mitchelston, Stow
 1848 Laurie, William Kennedy, of Woodhall, Castle-Douglas
 1868 Law, James, East Mains, Broxburn
 1876 Law, John, New Keig, Whitehouse, Aberdeen
 1868 Lawes, I. B., Rothamsten I. St Albans
 1873 Lawie, Alex., Implement and Manure Merchant, Laurene-kirk
 1874 Lawrence, James, Forres Mills, Forres

Admitted
 1876 Lawrence, W. F., Gowanhill, Cortes, Lonmay
 1872 Lawrie, Alex., Hardens, Dunse
 1859 Lawrie, James, Mitchelston, Stow
 1873 Lawrie, John, Kirklandhill, Leven
 1872 Lawrie, Thos., Esperston, Gorebridge
 1872 Lawrie, Thomas, Seed Merchant, Newton St Boswells
 1875 Lawrie, Wm., Architect, Inverness
 1876 Laws, Robert Seppings, Tenby, Pembrokeshire
 1853 Lawson, Alex., of Burnturk, Kettle
 1843 Lawson, Alexander, Merchant, Dundee
 1854 Lawson, Alexander, Old Mills, Elgin
 1876 Lawson, A. B., Clynelish, Brora
 1846 Lawson, Chas., 34 George Square, Edinburgh
 1871 Lawson, Charles, Deebank, Cults, Aberdeen
 1868 Lawson, C., Ordhead, Cluny, Aberdeen
 1868 Lawson, Geo. Stoddart, late Edinburgh
 1859 Lawson, Henry Graham, late Edinburgh
 1872 Lawson, James, Banker, Huntly
 1876 Lawson, James, Square, Huntly
 1867 Lawson, Thomas, of Carriston, Markinch
 1853 Lawson, Wm., Lessendrum, Huntly
 1858 Learmonth, Alexander, North Bank, Bo'ness
 1868 Learmonth, Lieut.-Col. Alex., of Dean, M.P., 73 Eaton Place, London
 1874 Learmonth, Jas., Flesher, Linlithgow
 1869 Learmonth, Thomas Livingstone, of Park Hall, Polmont
 1876 Ledingham, Alexander, Drumblair, Forgue, Huntly
 1863 Lee, John, Dollar Bank, Dollar
 1855 Lees, John, Marvingston, Haddington
 1863 Lees, Richard, Drinkstone, Hawick
 1823 Leigh, Rev. Peter, Golborne Park, Lancashire
 1864 Leishman, James, of Broomrig, Dollar
 1864 Leishman, T., Meiklewood, Gargunnoch, Stirling
 1858 Leitch, Arch. K., Inchstelly, Forres
 1841 Leith, Alex., of Freefield, Glenkiln, Inverkidie
 1873 LEITH, Sir Geo. H., of Ross, Bart., Ross Priory, Alexandria
 1869 Leith, Major Thomas, W. thall, Oyne
 1875 Leithel, James, The Bow, Stow
 1857 Lennie, John, Long Newton, Gifford
 1875 Lennox, Charles, Carntyne Chemical Works, Parkhead, Glasgow
 1873 Lennox, James, Doune of Glendouglaz, n
 1865 Lony, W. Macalpine, of Dalswinton, Dumfri s

Admitted

- 1876 Leslie, A. F., Corskellie, Huntly
 1840 Leslie, G. A. Young, of Kininvie,
 Lesmurdie House, Elgin
 1862 LESLIE, Hon. George Waldegrave,
 Leslie House, Leslie
 1857 Leslie, James, Thorn, Blairgowrie
 1868 Leslie, Lieut-Col. Jonathan Forbes, of
 Rothie Norman, Rothie Norman
 1873 Leslie, Robert C., of Butterglenn, Dun-
 keld
 1873 Leslie, William, of Nethermuir, Aber-
 deen
 1848 Leslie, Wm., of Warthill, Pitcaple
 1863 Lesslie, James, Boghall, Linlithgow
 1869 Liddell, Rev. John R., The Manse,
 Kirkliston
 1864 Lidderdale, Wm. H., Writer, Castle-
 Douglas
 1858 Ligertwood, John, Sheriff-Clerk,
 County Buildings, Aberdeen
 1875 Lightfoot, Henry Le Blanc, Ardgow-
 an, Greenock
 1872 Lillie, Wm., Implement Maker, Ber-
 wick-on-Tweed
 1841 Lindsay, Alexander K., of Balmungo,
 St Andrews
 1873 Lindsay, Jas., Whitecastles, Lockerbie
 1857 Lindsay, James, New Zealand
 1865 Lindsay, John, Thornhill, Stewarton
 1862 Lindsay, Robert, Lilliehill Fireclay
 Works, Dunfermline
 1857 Lindsay, Thomas, Flemington, La-
 mancha
 1869 Lindsay, Thos. S., 10 Chalmers Cres-
 cent, Edinburgh
 1854 Lindsay, William, 7 Hermitage Hill,
 Leith
 1855 Lindsay, W., Stanhope, Biggar
 1875 Linn, William, Chevington Woodside,
 Acklington
 1873 Linton, Simon, Glenrath, Peebles
 1863 Lithgow, E., Bedshiel, Greenlaw.
 Dunse
 1869 Little, James, Fauld, Longtown
 1859 Little, John, Meikleholmside, Moffat
 1870 Little, Wm., Burnfoot, Langholm
 1876 Littlejohn, William, Whitemyers, Old
 Skene Road, Aberdeen
 1863 Livingston, Thos. S. Fenton, of West
 Quarter, Mayfield House, Ardris-
 shaig
 1875 Lloyd, Thomas, of Minard Castle
 Inveraray
 1853 Loch, George, Q.C., London
 1832 Lockhart, Allan Elliot, of Borthwick-
 brae, Hawick
 1866 Lockhart, Robert, jun., 10 Polwarth
 Terrace, Edinburgh
 1872 LOCKHART, Sir Simon M., of Lee and
 Carnwarth, Bart., Lanark

Admitted

- 1870 Lockhart, Captain W. Elliot, yr. of
 Borthwickbrae, Hawick
 1859 Lockie, Wm., West Morriston, Earlston
 1872 Logan, Abraham, Hownam Grange,
 Kelso
 1831 Logan, Alexander, London
 1876 Logan, John Walker (Logan & Elder),
 Berwick-on-Tweed
 1872 Loney, Peter, Marchmont, Dunse
 1852 Longmore, Andrew, Rettie, Banff
 1858 Longmore, William, Banker, Keith
 1865 Lorimer, J., Achrossan, Tigh-na-
 bruaich
 1843 Lorimer, T. W., Mountrule, Douglas,
 Isle of Man
 1860 Lorimer, William, Rigg, Sanquhar
 1869† LORNE, Most Noble the Marquis of,
 K.T., M.P., Kensington Palace,
 London
 1869*† LOTHIAN, Most Noble the Marquis of,
 Newbattle Abbey, Dalkeith—*President*
of the Society
 1874 Lothian, Maurice John, Glenlora,
 Lochwinnoch
 1853† LOVAT, Right Hon. Lord, Beaufort
 Castle, Beaulieu
 1875 Love, Alex., Margaret's Mill, Kilmal-
 colm
 1874 Love, James, 1 Dellingburn Street,
 Greenock
 1857 Lovie, Alex., Nether Boyndlie, Fraser-
 burgh
 1843 Low, James, Mainhill, Dunse
 1861 Low, General Sir John, of Clatto,
 K.C.B., Cupar-Fife
 1861 Lowe, Robert, General Agent, Perth
 1850 Lowndes, James, of Arthurlee, Barr-
 head
 1871 Lowson, William, of Balthayock, Perth
 1859 Luke, Major John, 10 Abbotsford
 Crescent, St Andrews
 1862 Lumsdaine, Stamford R., of Lathallan,
 Colinsburgh
 1861 Lumsden, David, Pitcairnfield, Perth
 1850 Lumsden, G., Leslie Lodge, Inverurie
 1857 Lumsden, George, 20 Queen Street,
 Glasgow
 1877 LUMSDEN, General Sir Harry B.
 Belhelvie Lodge, Aberdeen
 1869 Lumsden, Henry, of Pitcaple, Pit-
 caple
 1877 Lumsden, Hugh Gordon, of Auchindoir,
 Aberdeen
 1844 LUMSDEN, Sir James, of Arden,
 20 Queen Street, Glasgow
 1875 Lumsden, James, yr. of Arden, 20
 Queen Street, Glasgow
 1849 Lumsden, James, Braco, Keith
 1876 Lumsden, William Harry, of Balmedie,
 Belhelvie

- Admitted
- 1876 Lundy, John J., Leith
 1870 Lusk, And., Howwell, Kirkeudbright
 1861 Lyal, Robert, Bennie, Braco
 1872 Lyal, William, Fogorig, Dunse
 1850 Lyall, Chas., Old Montrose, Montrose
 1854 Lyall, David, of Gallery, Montrose
 1850 Lyall, Robert, Carcary, Brechin
 1861 Lyell, John, Banker, Newburgh
 1859 Lyon, Jas., Burnhangh, Stonehaven
 1867 Lyon, G. F., of Kirkmichael, Captain R.N., Dumfries
 1870 Lyon, Thomas A., Whitecroft, Lockerbie
 1871 Lyon, William, 14 Jasmine Terrace, Aberdeen
- 1870 M'Adam, Jas. Nicol, High Trees, Marlborough, Wilts
 1857 Macadam, John, Blair'o'er, Drymen
 1859 Macadam, Dr Stevenson, F.R.S.E., Surgeon's Hall, Edinburgh
 1840 Macalister, A., of Loup and Torrisdale
 1842 Macalister, Keith, of Glenbarr, Tarbert
 1855 M'Alister, Robert, Mid Ascog, Rothessay
 1872 Macallum, Donald, Balligowan, Oban
 1873 M'Alpine, James, Tile Manufacturer, Stirling
 1854 Macandrew, D. M., Kilrock, Bridge of Allan
 1873 Macandrew, Henry C., Sheriff Clerk, The Castle, Inverness
 1862 Macarthur, John, of Barbreck, Banker, Inverary
 1840 Macarthur, Major Alexander
 1842 Macarthur, Duncan, New Zealand
 1840 Macaskill, Donald, of Rhudunan, New Zealand
 1873 McAuslan, James, Kirkmichael, Row
 1872 McAuslan, John, Inverlaran, Row
 1853 M'Auslan, J., late Kilbridebeg, Cairndow
 1872 M'Barnet, Col. A. C., New Club, Edinburgh.
 1865 M'Bean, D., Auchterblair, Carr Bridge
 1871 McBean, John, Factor's Office, Grantown
 1870 Maclean, Colonel William, of Tomatin, Inverness
 1871 McBeath, James, Brims, Thurso
 1863 Macbraire, James, of Broadmeadows, Berwick
 1870 M'Call, George, Burrance, Courance, Lockerbie
 1870 M'Call, James, Caitloch, Moniaive
 1868 M'Call, Professor J., Veterinary College, Glasgow
 1846 M'Call, Henry, of Daldowie, Glasgow
 1874 McCallum, Alex. Inglis, Chemist and V.S., 5 Grassmarket, Edinburgh
- Admitted
- 1872 McCallum, Dun., Clenmachrie, Oban
 1842 M'Callum George Kellie, of Braco, Castle Braco, Perthshire
 1861 M'Callum, John, Bank Place, Crieff
 1864 M'Callum, John, Fendoch, Crieff
 1875 McCamon, John, Kirronrae, Kirkcolum
 1864 M'Candlish, Jn. M'Gregor, W.S., 4 Doune Terrace, Edinburgh
 1871 McCash, John, Grain Merchant, Perth
 1873 McCaull, Peter, Dykedale, Dunblane
 1851 M'Caw, Alex., Greysowthen, Carlisle
 1857 M'Chlery, Henry, London
 1851 M'Clean, Alex. H., Auchneel, Stranraer
 1870 M'Clew, John, Dinvin, Portpatrick
 1870 M'Clymont, James, Borgue House, Kirkeudbright
 1840 M'Combie, J. Boyn, Advocate, Aberdeen
 1858 M'Combie, Peter, Upper Farmton, Whitehouse, Aberdeen
 1858 M'Combie, Robt., Brawliemuir, Drumlithie
 1840 M'Combie, William, of Easter Skene, Skene, Aberdeen
 1847 M'Combie, William, of Tillyfour, Aberdeen
 1857 M'Connachy, Archibald, Macremore, Campbeltown
 1858 M'Connach, Chas., Cairnballoch, Alford, Aberdeen
 1868 M'Connell, Frederic, of Robgill, Ecclefechan
 1874 M'Connell, William, of Knockdolian, Girvan
 1875 M'Connell, John A., Chapelheron, Whithorn
 1870 M'Connell, James, Glasnick, Newton-Stewart
 1842 M'Connell, John, Richmond, Surrey
 1856 M'Cowan, Robert, 12 Lynedoch Place, Glasgow
 1877 M'Cracken, Alex. Earl, Craiglemine, Glasserton, Whithorn
 1859 M'Culloch, Alexander, of Glen, Gatehouse of Fleet
 1870 M'Culloch, David, Bank-Agent, North Berwick
 1870 M'Culloch, John, Denbie Mains, Lockerbie
 1872 M'Culloch, John H., Skaith, Penninghame, Newton-Stewart
 1869 M'Culloch, R. C., Kirkland of Longcastle, Kirkcinner
 1849 M'Culloch, Walter, of Ardwell, Gatehouse of Fleet
 1871 M'Culloch, William, Crieff
 1858 M'Diarmid, Charles A., Rockwood Killin

Admitted

- 1858 M'Diarmid, D. A., Killiemore, Auchnacraig, Mull
 1875 M'Diarmid, Duncan, Glengoulandie, Aberfeldy
 1838 M'Donald, Dr Alex., Prince Edward's Island
 1841 Macdonald, Alexander, Wine Merchant, Inverness
 1854 Macdonald, A., Balranald, Lochmaddy
 1874 Macdonald, Alex., Nether Largie, Kilmartin
 1874 Macdonald, Alex. Ronald, Ord, Isle of Ornsay, Broadford, Skye
 1855 Macdonald, A. S., Cyderhall, Dornoch
 1841 Macdonald, Col. Alistair M'Ian, of Dalchosnie, Rannoch
 1875 Macdonald, C. Moreton, of Largie, Campbelltown
 1860 Macdonald, D., Athole Arms Hotel, Blair Athole
 1868 M'Donald, Donald, Culcraggie, Alness
 1872 Macdonald, Donald, Tormore, Broadford, Skye
 1869 Macdonald, D. J. K., of Sanda, 7 Craven Street, London
 1865 Macdonald, D. P., of Invernevis, Fort-William
 1871 M'Donald, J., Comrie Farm, Aberfeldy
 1875 M'Donald, John, of Newton, Lochmaddy
 1873 Macdonald, John, Porterfield, Renfrew
 1873 M'Donald, Neil M'Leod, of Dunach, Oban
 1861 Macdonald, Peter, The Douglas Hotel, Brodick, Ardrossan
 1868 Macdonald, R., Chuny Castle, Aberdeen
 1874 Macdonald, R. A., Ullinish, Portree
 1826 Macdonald, Robertson, William, of Kinlochmoidart, Fort-William.
 1874 Macdonald, Robertson, W. D. A., yr. of Kinlochmoidart, Fort-William.
 1839 Macdonald, Roderick C., of Castle Teirim, Prince Edward's Island
 1861 Macdonald, William, of Balnakilly, Blairgowrie
 1874 Macdonald, William, Editor, *North British Agriculturist*, Edinburgh
 1871 M'Donald, William, Woodlands, Perth
 1860 Macdonald, William S., Craigielaw, Longniddry
 1865 Macdonald, William, Caledonian Bank, Elgin
 1844 Macdonald, Lieut.-Col. Wm. Macdonald, of St Martin's, Perth
 1846 Macdonell, Eneas Ranald, of Morar, Fort-William
 1865 M'Douall, Jas., of Logan, Stranraer
 1847 M'Dougal, Alexander, Granton Mains, Edinburgh
 1868 M'Dougal, George, Blythe, Lauder

Admitted

- 1875 M'Dougal, Thos., Eskvale, Penicuik
 1872 M'Dougall, Col. Chas. A., of Dunollie, Oban
 1871 M'Dougall, John, Goodlyburn, Perth
 1860 M'Dougall, Archibald, Ardtalanaig, Kenmore
 1838 Macdougall, Captain James Patrick
 1853 M'Dougall, John, Kerrytonlia, Rothesay
 1871 M'Dougall, John W., yr. of Orchill, Blackford
 1870 M'Dowall, Andrew, Auchtralure, Stranraer
 1870 M'Dowall, Andrew, Malcolmstone, Hermiton
 1845 Macdowall, Henry, of Garthland, Lochwinnoch
 1875 Macdowall, Henry, yr. of Garthland, Lochwinnoch
 1874 Macduff, Alex., of Bonhard, 12 Bruntsfield Place, Edinburgh
 1859 MacDuff, James, Newmill, Stanley
 1876 M'Duff, Wm., Tomnagaurn, Dunkeld
 1834 Macewan, J., of Tar of Ruskie, Calderland
 1846 M'Ewan, Alexander, late of Sunderland
 1850 M'Ewan, John, Merchant, Glasgow
 1864 M'Ewen, John, Redside Farm, North Berwick
 1865 M'Ewen, John, Merchant, Stirling
 1865 MacEwen, John C., Inverness
 1873 M'Ewen, William, Cambushinnie, Dunblane
 1851 M'Farlan, John, Faslane, Garelochhead
 1874 Macfarlan, Alex. (Mealldarroch, Tarbert, Lochfine), 36 Brisbane Street, Greenock
 1857 Macfarlane, Alexander, Pollanilline, Campbelltown
 1873 M'Farlane, Colin, Strone, Glenfruin, Garelochhead
 1857 Macfarlane, Donald, Achray, Aberfoyle
 1860 Macfarlane, Donald, Balmuildy, Bishopbriggs
 1873 M'Farlane, Duncan, Greenfield, Garelochhead
 1857 Macfarlane, Duncan, Torr, Helensburgh
 1869 M'Farlane, James, of Easter Radernie, Dunfermline
 1857 Macfarlane, John, late of Ballenceroch, Lennoxtown
 1872 Macfarlane, John, Barnacarry, Kilmilver, Oban
 1873 Macfarlane, Lewis, Lettermay, Lochgoilhead
 1868 Macfarlane, Malcolm, Hutchestown Farm, Dunblane

Admitted

- 1862 Macfie, C., of Gogarburn, Corstorphine
 1865 Macfie, David J., of Borthwick Hall, Heriot
 1864 Macfie, Robert Andrew, of Dreghorn, Colinton
 1860 Macfie, Samuel, 29 Whitefield Road, Everton, Liverpool
 1869 Macfie, William, of Clermiston, Corstorphine
 1865 M'Gavin, Robert, of Ballumbie, Dundee
 1863 M'Gibbon, David, Limecraig House, Campbeltown
 1863 M'Gibbon, David, Architect, 89 George Street, Edinburgh
 1850 M'Gill, J., Torrorie, Dumfries
 1860 M'Gill, James, Rotchell, Dumfries
 1850 M'Gill, John, Barsalloch, Wigtown
 1867 M'Gilliewie, Donald, Bullnadrum, Pitlochry
 1876 MacGillivray, Dr. D. W., Eoligary, Barra, Lochmaddy
 1874 MacGillivray, John, Ballachroan, Kingussie
 1876 MacGillivray, William, Eoligary, Barra, Lochmaddy
 1876 M'Gonne, John G., Mains, Alexandria, N.B.
 1870 M'Gowan, William, Blegbie, Upper Keith
 1837 Macgregor, Alexander, London
 1872 M'Gregor, Donald, Ballinluig
 1870 M'Gregor, Donald, Royal Hotel, Edinburgh
 1857 Macgregor, Donald R., M.P., Merchant, Leith
 1874 MacGregor, Rev. J., Knockbain Mause, Munlochry
 1865 M'Gregor, James, late Badmenach, Grantown
 1874 M'Gregor, James G., Mulderg, Fearn
 1861 M'Gregor, John, Ladywell, Dunkeld
 1874 M'Gregor, P. Comyn, of Brediland, Lonend House, Paisley
 1868 MacGregor, R., St Ann's Brewery, Edinburgh
 1874 M'Gregor, Roderick, of Brae Rannoch, Kineraig, Kingussie
 1865 MacGregor, Thomas, Millerton, Inverness
 1870 M'Haffie, William J., of Torhouse-muir, Wigtown
 1872 M'Ilraith, James, 135 Hope Street, Glasgow
 1871 M'Ilraith, Thomas, Barwhanny, Kirkinner
 1872 M'Indoe, James, Glenmolachan, Leith
 1864 MacIndoe, Robert, Merkins, Alexandria
 1831 M'Inroy, James P., of Luth, Blair Athole

Admitted

- 1827 M'Inroy, Lieut.-Colonel William, of The Burn, Brechin
 1864 M'Intosh, David, of Havering Park, Romford, Essex
 1852 M'Intosh, Lieut.-Gen., of Campsie, K.H.
 1876 MacIntosh, John, of Cowhills, Peterhead
 1865 M'Innes, Duncan, of Cowden, Comrie, Crieff
 1875 M'Intyre, Daniel, Dunallan, Rothesay
 1873 M'Intyre, Daniel, Innkeeper, Pitlochry
 1861 MacIntyre, Donald, Tighmablair, Comrie
 1876 M'Intyre, Duncan, Refreshment Rooms, Thornton Junction
 1875 MacIntyre, Peter Brown, Mains of Findon, Dingwall
 1875 M'Intyre, Robert, St Martins, Invergordon
 1844 MacIntyre, J., Lochvoil Cottage, Oban
 1857 M'Isaac, John, Dunglass, Campbeltown
 1850 M'Iver, Evander, Scourie House, Lairg
 1854 Mack, William, of Berrybank, Reston
 1852 Mackay, Donald, Traill Street, Thurso
 1872 Mackay, George G., Grangemouth
 1877 Mackay, Henry, Shandwick Mains, Nigg, N.B.
 1870 Mackay, H. M. S., Banker, Elgin
 1875 Mackay, John, Home Farm, Portree
 1872 Mackay, John S., Banker, Grangemouth
 1870 Mackay, R. J., Burgie, Forres
 1874 Mackay, William, Melness, Lairg
 1875 Mackay, Thomas, Easter Moy, Arcan, Beaully
 1873 M'Kean, John, Grain Merchant, 65 Port Street, Stirling
 1857 M'Kean, Robert, Lumloch, Bishopbriggs
 1855 M'Kechnie, Neil, Dunoon
 1864 MacKechnie, James, Glenmore, Lochgilphead
 1869 MacKechnie, James, jun., Glenmore, Kilmelford, Lochgilphead
 1841 MACKENZIE, Right Hon. Lady Anne, of Seatwell
 1853 Mackenzie, Alexander, Banker, Elgin
 1874 Mackenzie, Alex., East Kinkell, Dingwall
 1862 MACKENZIE, Sir Alexander M., of Delvine, Burt, Dunkeld
 1846 Mackenzie, A., of Seatwell, 19 Charlotte Square, Edinburgh
 1869 Mackenzie, Alexander, Kincaid, of Raysbrig, Currie
 1875 Mackenzie, Alex., Merchant, 22 Church Street, Inverness

Admitted

- 1872 Mackenzie, Andrew, Dalmore Distillery, Alness
 1855 Mackenzie, Captain Boyce, Creich, Bonar Bridge
 1872 Mackenzie, Colin, W.S., 28 Castle Street, Edinburgh
 1869 Mackenzie, C. J., of Portmore, Eddleston
 1844 Mackenzie, Daniel, jun., Merchant, Glasgow
 1846 MACKENZIE, Sir Evan, of Kilcoy, Bart.
 1870 Mackenzie, James, Camden Quay, Cork
 1865 Mackenzie, James Fowler, of Allangrange, Munloch
 1868 Mackenzie, Captain James Dixon, of Findon, Mountgerald, Dingwall
 1838 MACKENZIE, Sir James J. K., of Scatwell, Bart.
 1871 Mackenzie, James T., of Kintail and Glenmuick, Ballater
 1848 Mackenzie, John, New Club, Edinburgh
 1865 Mackenzie, John, Duchlague, Cove, Greenock
 1872 Mackenzie, John, of Knipoche, Oban
 1853 Mackenzie, Jn. Monro, of Mornish, Garrion Tower, Wishaw
 1848 Mackenzie, John Ord, of Dolphinton, W.S., 9 Hill Street, Edinburgh
 1821 Mackenzie, John Whitefoord, W.S., 16 Royal Circus, Edinburgh
 1854 MACKENZIE, Sir K. S., of Gairloch, Bart., Conan House, Dingwall
 1846 Mackenzie, K. W. Stewart, of Seaforth, Brahan Castle, Dingwall
 1848 Mackenzie, Kenneth, C.A., Auditor of Accounts to the Society, 29 Northumberland Street, Edinburgh
 1874 Mackenzie, Nigel Banks, British Linen Bank, Fort-William
 1838 Mackenzie, Robert D., of Caldarvan, Alexandria
 1865 Mackenzie, Roderick G., of Flowerburn, Fortrose
 1846 Mackenzie, Thomas, of Ord, Beauly
 1852 Mackenzie, William, Unthank, Inchture
 1862 Mackenzie, William, Achindunie, Alness
 1857 M'Kerral, A., Brunerican, Campbeltown
 1874 M'Kerrow, And., Auchenskeoch, Southwick, Dumfries
 1876 M'Kerrow, M.S., Boreland of Southwick, Dumfries
 1865 Mackessack, J., Earnside, Forres
 1865 M'Kessack, Charles, Culblair, Fort-George Station
 1857 M'Kessack, John, Balnaferry, Forres

Admitted

- 1874 Mackessack, John, Kinloss, Forres
 1864 M'Kessack, Robert, of Ardgyle and Roseisle, Forres
 1874 Mackie, Alexr., Bandeath, Stirling
 1875 M'Kie, Andrew, Corrahill, Kirkcudbright
 1860 Mackie, George, of Dunjarg, Castle-Douglas
 1873 Mackie, James H. J., Invermay, Bridge of Earn
 1869 Mackie, James, Lewes, Fyvie
 1864 Mackie, James Logan, 18 Ashton Terrace, Glasgow
 1860 Mackie, John, Sarkshields, Ecclefechan
 1857 Mackie, Robert, Loudoun Cottage Galston
 1871 Mackie, William, Petty, Fyvie
 1872 Mackinlay, Daniel, 11 James Street, Portobello
 1818 Mackinlay, John, Whitehaven
 1869 M'Kinlay, John, Hardhill, Bathgate
 1860 M'Kinnel, J. B. A., Dumfries Iron Works, Dumfries
 1876 Mackinnon, Colin Macrae, Ardrishaig
 1869 Mackinnon, Lachlan, jun., Advocate, Aberdeen
 1876 Mackinnon, Wm., of Loup, Clachan, Kintyre
 1865 Mackintosh, C. Fraser, of Drummond, M.P., Inverness
 1839 Mackintosh, Æneas, of Daviot, Inverness
 1846 Mackintosh, Æneas, of Balnespick, Inverness
 1844 Mackintosh, Æneas W., of Raigmore, Inverness
 1844 Mackintosh, A., of Holm, Inverness
 1868 Mackintosh, C. H. (of Dalmunzie, Perthshire), M.D., Morden Hall, Torquay
 1846 Mackintosh, George Gordon, Richmond House, Twickenham, Middlesex
 1869 Mackintosh, James, of Lamancha, 2 Abbotsford Park, Edinburgh
 1854 Mackintosh, R. T., Seedsman, Edinburgh
 1874 M'Kirdy, Major-General D. Elliot (of Letham, Lanarkshire), New Club, Edinburgh
 1850 M'Kirdy, John Gregory, of Birkwood, Lesmahagow
 1860 M'Knight, Alexander, London
 1856 Maclachlan, Alexander, Carleith, Duntocher
 1873 M'Lachlan, Archd., 32 Queen Street, Stirling
 1875 M'Lachlan, Colin, Drums, Greenock
 1873 M'Lachlan, Colin, Woodend, Row

Admitted

- 1874 M'Lachlan, D., Lochgilphead
 1843 Maclachlan, George, of Maclachlan, W.S., 12 Abercromby Place, Edinburgh
 1872 Maclachlan, James, Doune Lodge, Burn of Cambus, Stirling
 1862 Maclachlan, W. A., of Auchentroig, Balfroun
 1876 Maclae, Alex. Crum, of Cathkin, Carmunnock
 1853 Maclagan, D., M.D., Prof. of Medical Jurisprudence, University of Edinburgh, 28 Heriot Row
 1869 Maclagan, David, C. A., 9 Royal Circus, Edinburgh
 1847 Maclagan, Peter, Birchwood, Birnam, Perthshire
 1847 Maclagan, Peter, of Pumpherston, M.P., Clifton Hall, Ratho
 1873 Maclagan, Robert Craig, M.D., 5 Coates Crescent, Edinburgh
 1847 Maclaine, Hugh, Glenrisdell, Tarbet, Kintyre
 1870 MacLaine, Murdoch G., of Lochbuy, Oban
 1855 Maclanachan, James, Van Diemen's Land
 1859 Maclaren, D., Corrychrone, Callander
 1853 M'Laren, Duncan, M.P., Newington House, Edinburgh
 1873 M'Laren, James, Little Sauchie, St Ninians
 1839 Maclaren, Dr John, Blairgowrie
 1871 M'Laren, James, Solicitor, Crieff
 1864 M'Laren, J., late Gogar Park, Corstorphine
 1873 M'Laren, John, Craggish, Comrie
 1858 M'Laren, John, Retreat House, Scone, Perth
 1859 M'Laren, John, Brae of Monzievaired, Crieff
 1859 M'Laren, Joseph (late Greenhead of Arnot, Kinross), Australia
 1876 M'Larin, Dougald, Dalbeattie
 1875 M-Latchie, William, Hillside, Campbelltown
 1835 Maclean, Colonel Allan Thomas
 1837 Maclean, Archibald D., London
 1875 M'Lean, Arch. John, of Pennyross, Auchnacraig Mull
 1871 M'Lean, Charles, of Glenearn, Bridge of Earn
 1875 Maclean, Chas., Milton, South Uist Lochmaddy
 1838 Maclean, Colin, of Lagan, Islay
 1873 M'Lean, Daniel, Hillwood, Ratho
 1861 Maclean, Duncan, Bellnollow, Crieff
 1849 Maclean, George, 5 Albert Drive, Crosshill, Queen's Park, Glasgow

Admitted

- 1854 Maclean, Hector Frederick, W.S., 3 Hill Street, Edinburgh
 1857 M'Lean, James, Bennetsfield House, Fortrose
 1860 Maclean, J., Clerk of Supply, Wigtown
 1860 M'Lean, Lachlan, Pitilie, Aberfeldy
 1823 Maclean, Dr Lachlan, Helenlee, Oban
 1846 Macleay, Alex. D., Conservative Club, London
 1839 Macleay, Kenneth, 16 Grosvenor Street, London
 1875 M'Leish, Dan., Bank of Scotland, Fort-William
 1877 Macleish, G.S., Wester Drumartherty, Spittalfield, Dunkeld
 1871 M'Lellan, David, of Marks, Kirkcudbright
 1857 Maclellan, T., North Balfern, Kirkinner
 1875 MacLennan, Alexander, Leanassie, Kintail
 1865 MacLennan, Donald, Hilton, Beaully
 1864 MacLennan, John, Carnoch, Strathconon, Beaully
 1874 MacLennan, James, Fornightly, Nairn
 1830 Macleod, Donald, Coulmore, Inverness
 1874 Macleod, Dun. D. M'L., Coulmore, Inverness
 1875 M'Leod, F. H., 30 Ann Street, Glasgow
 1849 Macleod, John N., Banker, Kirkcaldy
 1839 Macleod, Norman, of Macleod, South Kensington Museum, London
 1875 M'Master, William, Challoch, Dunragit
 1854 Macleod, R. B. Æneas, of Cadboll, Invergordon Castle, Invergordon
 1865 M'Leod, W. A., Scorrybreck, Portree
 1875 Macleod, Captain, of Orbost, Rum
 1874 M'Master, Allan, Glenhead House, Stranraer
 1871 M'Master, Hugh, Blairbuie, Port-William
 1875 M'Master, John, Culhorn Mains, Stranraer
 1870 M'Millan, John, of Glenerosh, Moniaive
 1861 MacMillan, J. G., Dereel House, Barns Park, Ayr
 1872 M'Millan, Robert, Polgowan, Newton Stewart
 1875 M'Min, Thos. M'C., Upper Wellwood, Muirkirk
 1854 M'Minn, F., 1 Graham Street, Edinburgh
 1870 M'Monnies, James, Culquha, Ringford, Castle-Douglas
 1872 M'Murich, James, Stuckievullich, Arrochar

Admitted

- 1873 M·Murrich, Peter, Kennet Village, Alloa
 1865 M·Nab, Alexander, of Techmuiry, Glenochil House, Menstrie
 1873 M·Nab, Donald, Duchlage, Luss
 1873 M·Nab, Jas., Loaning Bank, Menstrie
 1872 M·Nab, John, Hotel, Arrochar
 1873 M·Nab, John, Bracklin, Callander
 1865 Macnaghten, Steuart, of Inver Trosachs, Bitterne Manor House, Southampton
 1857 M·Nair, James, Smerby, Campbeltown
 1857 M·Nair, John, 33 Moray Place, Edinburgh
 1876 M·Nair, Robert, Westertown, New Kilpatrick
 1857 M·Naughton, Alex., Remony, Kenmore
 1859 M·Naughton, Alexander, Kerrowmore, Glenlyon, Aberfeldy
 1071 M·Naughton, Alexander, York Place, Edinburgh
 1870 M·Naughton, Daniel, Leith
 1854 Macnaughton, J., of Smithfield, Standalane House, Stewarton, Kilmarnock
 1871 M·Naughton, John, Kerrowmore, Glenlyon, Aberfeldy
 1871 M·Naughton, Wm., Riechip, Dunkeld
 1848 Macneal, H., of Ugadale, Campbeltown
 1870 M·Neilie, Alexander, Redcastle, Dalbeattie
 1846 M·NEILL, Right Hon. Sir John, G.C.B., Burnhead, Liberton
 1860 M·Neill, John Carstairs, late of Ardlussa, Jura
 1861 M·Neillie, W., of Castlehill, Dumfries
 1873 M·Nicol, John, Courshelloch, Clachan, Tarbet
 1876 M·Nicol, John, Salachael, Fasnacloich, Fort William
 1857 M·Niven, Alex., Inneshewan, Killin
 1876 Maconchy, John Arthur, Rathmore, Aughnaccliffe, County Longford.—
Free Life Member
 1877 Maconochie, John Allan, Gattonside House, Melrose
 1852 Maconchie, Robert Blair, of Gattonside, W.S., 10 Hill Street, Edinburgh
 1874 Macphail, Alex., Culaird, Inverness
 1857 M·Phail, Alexander, America
 1876 M·Phail, Donald, Cameron, Mull
 1876 M·Phail, Donald, Laggan, Mull
 1875 MacPhail, Donald, Oskamul, Aros, Mull
 1876 M·Phail, Dugald, Barachendruman, Lochbuy, Mull

Admitted

- 1871 MacPherson, Donald, Glen Nevis, Fort-William
 1865 Macpherson, Col. D. E. B., of Belleville, Kingussie
 1875 M·Pherson, Donald, Lettermore, Aros, Mull
 1876 M·Pherson, Donald, Argyle Arms Hotel, Inverary
 1865 Macpherson, Duncan, Kingussie
 1827 Macpherson, Ewen, of Cluny Macpherson, Cluny Castle, Kingussie
 1872 Macpherson, George G., Cat Lodge, Kingussie
 1865 Macpherson, James, Clunas, Cawdor, Nairn
 1876 Macpherson, John, Achlochrach, Glenriunes, Dufftown
 1856 Macpherson, John, Blantyre Farm, Glasgow
 1857 Macpherson, J., Lord Chamberlain's Office, London
 1860 Macpherson, J. (late Killihuntly, Kingussie), Ontario, Canada
 1870 Macpherson, Colonel Lachlan, of Glen-trium, Newtonmore
 1871 M·Pherson, Lauchlan, Laggan, Crieff
 1857 M·Queen, J., of Boquhapple, Thornhill, Stirlingshire
 1870 Macqueen, James, of Crofts, Dalbeattie
 1873 MacQueen, James, Divers Wells, Alloa
 1850 Macrae, Don., Vallay, North Uist
 1874 Macrae, Dun. A., Fernaig, Strome Ferry
 1874 MacRae, Rod., Mains of Erchless, Beaulay
 1831 Macritchie, Thomas Elder, of Craighton, 4 Gayfield Square, W.S., Edinburgh
 1868 M·Robbie, Peter, Sunnyside, Aberdeen
 1871 MacRosty, James, Solicitor, Crieff
 1873 Mactaggart, Charles, Banker, Campbeltown
 1876 M·Taggart, John, Culnaightry, Auchencairn, Castle Douglas
 1874 Mactavish, Alex., Implement Maker, Inverness
 1857 M·Tavish, Duncan, America
 1848 Mactier, Alexander Walker, 24 Marina, St Leonards-on-Sea
 1828 Macvicar, Rev. J. G., D.D., Moffat
 1876 M·William, Mrs, Bucharn, Huntly
 1869 M·William, D., Cairnfield, Kirkinner
 1876 M·William, James, Stoneytown, Boharm, Keith
 1870 M·William, Robert, Craichmore, Stranraer

Admitted
 1839 Madden, Henry R., M.D., Australia
 1875 Maddison, Henry, The Lindens, Darlington
 1870 Main, George Agnew, Portland Square, Carlisle
 1874 Main, James A. R. (A. and J. Main & Co.), Renfield Street, Glasgow
 1877 Maitland, David, of Dundrennan, Kirkcudbright
 1871 Maitland, Henry, Hillfoot, Duddingston
 1858 Maitland, James, jun., Little Methlic, Methlic
 1867 MAITLAND, Sir James Ramsay Gibson, of Clifton Hall, Bart., Craighend House, Stirling
 1875 Maitland, Robt., Balhalgardy, Inverurie
 1858 Maitland, William, of Shannaburn, Maryculter, Aberdeen
 1841 Makgill, G., of Kemback, Prestbury, Cheltenham
 1869 Malcolm, George, Factor, Invergarry
 1876 Malcolm, William, Carsaig, Mull
 1840 Malcolm, W. E., of Burnfoot, Langholm
 1861 Mangles, George, Givendale, Ripon, Yorkshire
 1840 MANSEL, Sir John, Bart., Maesteilo, Llandilo, Carmarthenshire
 1833† MANSFIELD, Right Hon. the Earl of, K.T., Scone Palace, Perth
 1869 Mansfield, James L., Advocate, 10 Albany Street, Edinburgh
 1872 MAR and KELLIE, Right Hon. the Earl of, Alloa Park, Alloa
 1855 MARJORIBANKS, Sir Dudley Coutts, of Gaisachan, Bart., 3 Grafton Street, London
 1854 MARJORIBANKS, Sir John, of Lees, Bart., Coldstream
 1856 Marjoribanks, John, Camptoun, Drem
 1854 Marjoribanks, Wm., Warriston House, Inverleith Row, Edinburgh
 1877 Mark, John, Craighend, Stow
 1877 Mark, Robt. Agricultural Hall, Leven Street, Edinburgh
 1876 Marr, John, Mill of Kingoodie, Old Meldrum
 1864 Marr, J. A., late of Alderston, Mid-Calder
 1855 Marr, Wm. Smith, Upper Mill, Tarves
 1873 Marryat, George Selwyn, late 19 Hope Terrace, Edinburgh
 1873 Marshall, James, of Duncricvie, Milnathort
 1868 Marshall, Jas. (Marshall, Sons, & Co.), Gainsborough
 1847 Marshall, John, Clebrig, Lairg
 1860 Marshall, Thomas, The Howes, Annan
 1872 Marshall, William Hunter, of Callander, 25 Heriot Row, Edinburgh

Admitted
 1875 Martin, Donald T., Auchendennan, Bonhill
 1875 Martin, Hugh, S.S.C., 7 Hope Street, Edinburgh
 1858 Martin, James, Newmarket, Aberdeen
 1875 Martin, John, Ardnahoe, Rothsay
 1874 Martin, John, Beechwood Mains, Corstorphine
 1858 Martin, John, Claggan, Kenmore
 1865 Martin, John, Shore, Kincardine-on-Forth
 1867 Martin, John M., yr. of Auchendennan, Bloomhill, Cardross
 1854 Martin, Dr N., of Glendale, Dunvegan
 1870 Martin, William, of Dardarroch, Dunscore, Dumfries
 1859 Mason, Robert, Corstorphine Hill House, Edinburgh
 1874 Masson, John, Kindrummond, Deres
 1874 Masson, John, Mill of Cammie, Banchory
 1875 Mather, Edward, 6 Viewforth Terrace, Edinburgh
 1874 Mather, John Arres, Delnias, Nairn
 1876 Mather, William, Muirhead Cottage, Moodiesburn
 1873 Mather, William, Kirkhill, Newton Mearns
 1846 Matheson, Alexander, of Ardross, M.P., Duncraig House, Strone Ferry
 1843 MATHESON, Sir James, of The Lews, Bart., Lews Castle, Stornoway
 1871 Matheson, Kenneth, Contractor, Provost of Dunfermline
 1853 Mathews, N., Whitehills, Garliestown
 1864 Mathie, James, Banker, Stirling
 1871 Matthew, P. M., 32 Coates Gardens, Edinburgh
 1871 Maury, William, Solicitor, Perth
 1870 Maxwell, Captain Heron, yr. of Springkell, Ecclefechan
 1861 Maxwell, Edward Heron, of Teviotbank, Hawick
 1865 Maxwell, Francis, of Gribton, Monreith, Port William
 1873 Maxwell, George, of Broomholm, Langholm
 1838 MAXWELL-STUART, Hon. Henry Constable, of Traquair, Peebles
 1839 MAXWELL, Sir John H., of Springkell, Bart., Ecclefechan
 1867 Maxwell, Maxwell Hyslop, of The Grove, Dumfries
 1869 Maxwell, General Harley, of Perth, Dk. Dumfries
 1857 Maxwell, R., Ballachgair, Cupar, 1-town
 1829 Maxwell, Wellwood H., of Munches Dalbeattie

Admitted	Admitted
1841 MAXWELL, Sir W., of Cardoness, Bart., Gatehouse	1877 Menzies, Neil James, yr. of Menzies, Scots Fusilier Guards
1875 Maxwell, William Hall, of Dargavel, Bishopton	1841 MENZIES, Sir Robert, of Menzies, Bart., Farleyer, Aberfeldy
1873 Maxwell, William Jardine, yr. of Munches, Dalbeattie	1871 Menzies, Robert, S.S.C., 5 North St David Street, Edinburgh
1841 MAXWELL, Sir William Stirling, of Polloc, Bart., K.T., M.P., Keir, Dunblane— <i>Honorary Secretary of the Society</i>	1865 Menzies, William, Keilator, Killin
1875 Mearns, Rev. Duncan G., Oyne Manse, Aberdeenshire	1870 Menzies, William J., W.S., 22 Hill Street, Edinburgh
1859 Mears, William, 24 Buccleuch Street, Edinburgh	1861 Mercer, Daniel, Achamore, Dunoon
1875 Medley, Spencer M., Ellandonan Villa, Inverness, Commander R.N.	1850 Mercer, Græme R., of Gorthy, Glen Tulchan, Perth
1875 Meek, John, Flesher, Whitburn	1861 Mercer, John, Ardenadam, Dunoon
1857 Meiklam, John, of Gladswood, Melrose	1870 Merricks, H. J., Eskhill, Roslin
1854 Meikle, David, late Clunie Mains, Kinglassie	1870 Merricks, J. L., Gunpowder Mills, Roslin
1876 Meikle, James, Lugtonridge, Beith	1870 Merricks, William, Gunpowder Mills, Roslin
1858 Meikle, James, Nether Mains, Killwinning	1872 Merrilees, Robert, 51 Argyll Street, Glasgow
1867 Meikle, John, Seafield, Bathgate	1875 Merson, James Craigwillie, Huntly
1869 Meikle, Wm., East Breich, West Calder	1865 Methven, Thomas, Nurseryman, 15 Princes Street, Edinburgh
1862 Meiklejohn, John, Foundry, Dalkeith	1873 Michael, James, 3 Caledonian Place, Edinburgh
1861 Mein, Andrew Whytock, of Hunthill, Jedburgh	1867 Michie, C. Y., Forester, Cullen House, Cullen
1863 Mein, Benj., Roxburgh Barns, Kelso	1865 MIDDLETON, Right. Hon. Lord, Birdsall House, York
1860 Mein, N. A., Marsh House, Canonbie	1876 Middleton, Alex., Belmont, Aberdeen
1863 Mein, William, Seedsman, Crofthouse, Kelso	1875 Middleton, A. A., Rosefarm, Invergordon
1869 Meldrum, J., of Eden Bank, Pittormie, Cupar-Fife	1840 Middleton, C. S., late Merchant, Liverpool
1854 Melrose, Jonathan, Coldstream	1864 Middleton, George, Cornton, Dingwall
1869 Melrose, Patrick, West Loch, Eddlestone	1872 Middleton, James, Commission Agent, Aberdeen
1819 Melville, J. W., of Bennoch, Mount Melville, St Andrews	1863 Middleton, John, Kinfauns Castle, Perth
1862 Melvin, Charles, Penston, Tranent	1872 Middleton, Jonathan, Davidston, Invergordon
1849 Melvin, James, Bonnington, Wilkieston	1872 Middleton, Jonathan, Clay of Allan, Fearn, Tain
1876 Menzies, Alex., Grain Merchant, Airdrie	1858 Middleton, William, Bridgfoot, Monymusk
1863 Menzies, Duncan, C.E., 13 Young Street, Edinburgh	1873 Mill, Allan, Dods, Lauder
1864 Menzies, Duncan, 20 Ness Bank, Inverness	1853 Millar, C. H., of Blair Castle, 5 Palmerston Place, Edinburgh
1875 Menzies, Fergus, Blackhall, Dunfermline	1870 Millar, James, of Priestlands, Dumfries
1841 Menzies, Fletcher Norton, Edinburgh— <i>Secretary of the Society</i>	1852 Millar, James Lawson, of Waulkmill, Dunfermline
1853 Menzies, Graham, Westbourne Terrace, London, W.	1864 Millar, James, Mills of Torr, Blair-Drummond
1869 Menzies, James, of Pitnacree, M.D., Ballinluig	1853 Millar, Thos., Briggs, Cramond Bridge
1874 Menzies, John, Caledonian Hotel, Inverness	1854 Millar, Thomas, of Balliesk, Dollar
1870 Menzies, John, Kelloe Mains, Edrom	1871 Millar, William, Over Kinfauns, Perth
1849 Menzies, J. A. Robertson, Dunalastair, New Zealand	1843 Miller, Captain Alexander Penrose
	1873 Miller, Colin W., Wellwood, Bridge of Allan

Admitted

- 1868 Miller, G. J., of Frankfield, Glasgow
 1861 Miller, George, St Magdalenes, Perth
 1853 Miller, Hew, Westerton, Ochertyre, Crieff
 1847 Miller, John, of Leithen, 2 Melville Crescent, Edinburgh
 1861 Miller, John, Scrabster, Thurso
 1874 Miller, John, Seafield, Cullen
 1843 Miller, O. G., Dundee
 1873 Miller, Thomas, of Myres, St Ninians
 1864 MILLER, Sir William, of Manderston, Bart., Dunse
 1870 Millie, George, Kilmaron, Cupar-Fife
 1855 Milligan, James, Hayfield, Thornhill
 1870 Milligan, John, Merkland, Dunscore
 1857 Mills, George, Greenend, St Boswells
 1859 Mills, G., late Horsburgh Castle, Peebles
 1858 Milne, A., Corse of Kinnoir, Huntly
 1855 Milne, Alex., Mill of Allathan, Udney
 1856 Milne, J., Netheron of Pittendrum, Fraserburgh
 1856 Milne, J., Union Bank of Scotland, Elgin
 1857 Milne, James, Balnagubs, Stonehaven
 1859 Milne, James (late Meinfoot, Ecclefechan), America
 1862 Milne, James, Banker, Huntly
 1867 Milne, John, Mains of Laithers, Turriff
 —Free Life Member 1873
 1863 Milne, Nicol, Dryhope, Selkirk
 1861 Milne, Peter, 19 Buccleuch Place, Edinburgh
 1866 Milne, W., Tillycairn, Cluny, Aberdeen
 1875 Milroy, James, Galdenoch, Stoneykirk
 1876 Milroy, John, Balgreggan Mains, Stranraer
 1863 Minto, Right Hon. the Earl of, Minto House, Hawick
 1870 Minto, John D., Dumfries
 1876 Mitchell, Alex., Balgreen, King Edward, Banff
 1851 Mitchell, Alex., of Sauchrie, Maybole
 1857 Mitchell, A., Tillicoultry House, Alloa
 1870 Mitchell, Alex., Implement Maker, Peterhead
 1848 Mitchell, Andrew, Alloa
 1874 Mitchell, Andrew, Drumderfit, Munchloch
 1875 Mitchell, Andrew, Ratagan House, Glenshiel, Inverness
 1848 Mitchell, H., of Polmood, 45 Albany Street, Edinburgh
 1857 Mitchell, Hugh, High Lossit, Campbeltown
 1877 Mitchell, Hugh, Banker, Pitlochry
 1851 Mitchell, James, Dologan, Aberystwith
 1857 Mitchell, Duncan, Arrochar
 1874 Mitchell, James R., Drynie, Inver-

Admitted

- 1857 Mitchell, J., Homeston, Campbeltown
 1864 Mitchell, James, Banker, Pitlochry
 1850 Mitchell, J., Ballemenach, Campbeltown
 1873 Mitchell, John, jun., Barcheskie, Rerrick, Kirkeudbright
 1861 Mitchell, John, Fliskmiln, Cupar-Fife
 1876 Mitchel, John, Lairshill Fintray, Aberdeen
 1864 Mitchell, John, Dingwall
 1872 Mitchell, John, Knockhouse, Dunfermline
 1836 Mitchell, J., Civil Engineer, Inverness
 1873 Mitchell, John Forbes, of Thainston, Kintore
 1870 Mitchell, Joseph M., Burnscairth Green, Dumfries
 1859 Mitchell, Robert, Brewer, 3 Bonnygate, Cupar-Fife
 1850 Mitchell, S., Dalivaddy, Campbeltown
 1874 Mitchell, William (late Methven), Cassochie, Glasgow
 1876 Mitchell, William, Meikle Dens, Longside, Aberdeen
 1862 Mitchell, Wm., Merchant, Montrose
 1869 Mitchell, Wm., S.S.C., 15 Magdala Crescent, Edinburgh
 1863 Mitchell, Wm., Ribigill, Lairg
 1868 Mitchell, Wm. A., Auchnagathel, Keig, Aberdeen
 1849 Mitchell, W. G., of Carwood, Biggar
 1832 Mitchellson, Archibald Hepburne, Tay Terrace, Dunkeld
 1861 Moffat, George, 10 Hamilton Terrace, Partick
 1860 Moffat, James, Gateside, Kirkeconnel, Sanquhar
 1867 Moffat, James, of Kenervie, British Linen Bank, Castle Douglas
 1869 Moffat, James, Kirkclinton Park, Kirkclinton, Carlisle
 1850 Moffat, John, Craick, Hawick
 1862 Moffat, Thomas, Drumbuie, Sanquhar
 1864 Moffat, Wm., Chatsworth, Victoria
 1871 Moir, James, Banker, Alloa
 1858 Moir, James, Mains of Wardhouse, Inch, Aberdeen
 1873 Moir, James M'Arthur, of Hillfoot, Dollar
 1876 Moir, Peter, Nottingham Place, Edinburgh
 1876 Moir, William, Nottingham Place, Edinburgh
 1873 Mollison, James, Factor, Dochgarroch Lodge, Inverness
 1812 Moncrieff, Alexander, W.S., Perth

Admitted	Admitted
1852 Moncrieff, Major Alexander, of Barnhill, Perth	1875 Morton, John, Nether Abington, Abington
1866 Moncrieff, David Scott, W.S., 24 George Square, Edinburgh	1861 Morton, John, North Muirton, Perth
1848 MONCRIEFF, Right Hon. Lord, of Tulliebole, Lord Justice-Clerk, 15 Great Stuart Street, Edinburgh	1859 Mossman, H., of Auchtyfardle, Lanark
1843 ² MONCREIFFE, Sir Thomas, of Moncreiffe, Bart., Bridge of Earn	1864 Mossman, Adam, Blacket Place, Edinburgh
1833 Monro, A. B., of Auchinbowie, Stirling	1843 Moubray, John M., late of Hartwood
1851 Monro, David, of Allan, Tain	1862 Moubray, Robert, Cambus Distillery, Stirling
1846 Monteith, B., Tower Mains, Liberton	1865 Mounsey, J. T., of Kingfield, Longtown, Cumberland
1866 Monteith, D., Belleville Lodge, Blacket Place, Newington, Edinburgh	1867 Muckart, James, Land Steward, Barns Cottage, Maybole
1837 Monteith, Robert, of Carstairs	1873 Muir, Andrew Lees, Coal Merchant, Stirling
1870 Montgomery, And., Boreland, Castle-Douglas	1852 Muir, G. W., Kirkhouse, Traquair, Innerleithen
1843 MONTGOMERY, Sir G. Graham, of Stanhope, Bart., M.P., Stobo Castle, Stobo	1864 Muir, James, Hardington Mains, Wiston, Biggar
1846 Montgomery, John H., of Newton, Stobo Castle, Stobo	1843 Muir, John, late of Gartferrie
1871 Montgomery, Thomas H., of Hattonburn, Milnathort	1863 Muir, W. H., Toravon, Linlithgow
1873 Montgomery, Wm., jun., Parkend Farm, Helensburgh	1877 Muir, William, Lochdougan, Castle Douglas
1876 MONTROSE, His Grace the Duke of, Buchanan Castle, Drymen	1862 Muirhead, E. W., The Hill, Putney-Surrey
1839 Moore, John C., of Corsewall, Stranraer	1872 Muirhead, F., Eaglescarnie Mains, Haddington
1869 Moray, H. D., of Abercainry, Crieff	1863 Muirhead, George (late Durdie, Errol), London
1876 Moir, John, Fordhead, Gargunnoch	1872 Muirhead, Geo., Paxton, Berwick-on-Tweed
1868 Morgan, David, South Mains of Ethie, Arbroath	1865 Muirhead, J. J., 62 Princes Street, Edinburgh
1861 Morison, James, Holt Farm, Studley, Warwickshire	1865 Muirhead, John, Salton Mains, Tranent
1850 Morison, James G., Glasgow	1867 Muirhead, Robert, Chesterhall, Biggar
1862 Morison, J. B. B., of Finderley, Kinross	1875 Muirhead, Thomas, North Crookedstone, Hamilton
1871 Morris, William, V.S., 7 Langstane Place, Aberdeen	1875 Muirhead, Wm., Auchenairn, Bishopbriggs
1855 Morrison, Charles, of Islay, Bridgend, Islay	1876 Muirhead, William, Meikle Richorn, Dalbeattie
1858 Morrison, Harry L. L., of Blair, East Grange, Forres	1873 Muirhead, William, Pirnhall, Bannockburn
1850 Morrison, James, Glasgow	1873 Munby, Edward Chas., Myton Grange, Helperby, Yorkshire— <i>FreeLifeMember</i>
1873 Morrison, James M., Banker, Stirling	1858 Mundell, D., Gollanfield, Fort George Station
1876 Morrison, John, junior, Hattonslap, Old Meldrum	1876 Mundell, James P., Keith
1859 Morrison, John, West Dalmeny, South Queensferry	1874 Mundell, John, Fortrose
1876 Morrison, Thomas, 32 Glassford Street, Glasgow	1870 Mundell, Walter Grieve, Inverlaur, Dingwall
1872 Mortimer, Thos. A., 86 George Street, Edinburgh	1864 Munro, A., Ballintraid, Invergordon
1876 Mortimer, William, Old Keig, Keig	1874 Munro, Alexr., Ord, Invergordon
1846 MORRISON, Right Hon. the Earl of, Dalmahoy, Mid-Calder	1874 Munro, A. P. C., of Rockfield, Fearn
1835 Morton, H., Belvidere House, Trinity	1874 Munro, Chas., Cattle Salesman, Inverness
1861 Morton, J., Lambieytham, St Andrews	1864 Munro, D., Contin, Dingwall
	1877 Munro, Duncan H. Campbell, yr. of Kinlochlauch, Mileburn, Gourrock
	1853 Munro, John, Fairington, Kelso

Admitted

- 1877 Munro, John, Limlair, Dingwall
 1874 Munro, John, Seedsman, Inverness
 1874 Munro, Henry, Corn Merchant, Inverness
 1870 Munro, Robert, Coyesea, Duffus, Elgin
 1870 Munro, William, Kenmore, Aberfeldy
 1875 Murdoch, Alex., Garteraig, Shettleston
 1865 Murdoch, George Burn, Greenhill Lodge, Edinburgh—*Free Life Member*
 1875 Murdoch, James, Carntyne, Shettleston
 1874 Murdoch, James F., Hallside, Cambuslang
 1853 Murdoch, John Burn, of Gartineaber, Advocate, Greenhill Lodge, Edin.
 1875 Murdoch, John, Carntyne, Shettleston
 1875 Murdoch, John, Hilton, Bishopbriggs
 1857 Murdoch, Robert, Hallside, Cambuslang
 1856 Murdoch, William, Solicitor, Huntly
 1847 MURE, Hon. Lord, 12 Ainslie Place, Edinburgh
 1861 Mure, Lieut.-Col. William, M.P., of Caldwell, Beith
 1870 Mure, William J., Advocate, 12 Ainslie Place, Edinburgh
 1846 Murray, Andrew, of Conland, 67 Bedford Gardens, Kensington, London
 1828 Murray, Anth., of Dollerie, W.S., 141 George Street, Edinburgh
 1871 Murray, C. A., Taymount, Stanley
 1864 Murray, D., late 31 Queen Street, Edinburgh
 1871 Murray, David, Dunira, Crieff
 1871 Murray, David, Banker, Meigle
 1860 Murray, Rev. George, of Torquhain, Balmacellan Manse, New Galloway
 1854 Murray, George, New Zealand
 1865 Murray, G. R., Chapelrossan, Stranraer
 1867 Murray, G., Elvaston Castle, Derby
 1869 Murray, G. W., Banff Foundry, Banff
 1843 Murray, Jack H., Captain R.N., Easthaugh, Pitlochry
 1850 Murray, James, East Barns, Dunbar
 1857 Murray, James, Dumfries Arms Hotel, Cunnock
 1873 Murray, James, of Gartur, Stirling
 1861 Murray, James, Catter House, Drymen
 1869 Murray, James Wolfe, of Cringletie, Peebles
 1846 MURRAY, Sir John, of Philiphaugh, Bart., Selkirk
 1862 Murray, John L., of Heavyside, Biggar
 1863 Murray, Lieut.-Col. John, of Polmaise, Stirling
 1863 Murray, Dr John, Kersknowe, Kelso
 1873 Murray, John, Munnieston, Thornhill, Stirling
 1863 Murray, John, of Wooplaw, Galashiels

Admitted

- 1862 MURRAY, Sir Patrick Keith, of Ochertyre, Bart., Crieff
 1850 Murray, Robert, 64 Grove St., Edin.
 1858 Murray, R., 7 Roxburgh Place, Edin.
 1874 Murray, Robert G., of Spittal, Biggar
 1875 Murray, Robert W. E., Wester House Byres, Galashiels
 1857 Murray, Thomas, Braidwood, Penicuik
 1852 Murray, Thomas G., W.S., 11 Randolph Crescent, Edinburgh
 1869 Murray, Wm., Murdoston, Shotts
 1856 Murray, William, Kileoy, Kilearnan, Ross-shire
 1858 Murray, Wm., Mains of Pittendreich, Turrit
 1859 Murray, John, Banker, Stirling
 1859 Mustard, Alex., Leuchland, Brechin
 1876 Mutch, Alexander, Mains of Newhall, Stonehaven
 1875 Mutter, John, 29 Chalmers Street, Edinburgh
 1858 Myers, Geo. C., Town-Clerk, Montrose
 1864 Myles, James, Deanside, Renfrew
 1860 Mylne, Thos., Niddrie Mains, Liberton
 1874 Nairne, William, of Dunsinnane, Perth
 1843 NAPIER and ETRICK, Right Hon. Lord, K.T., Thirlstane Castle, Selkirk
 1875 Napier, John S., of Lethawe, Strathaven
 1848 NAPIER, Sir R. J. M., of Milliken, Bart., Johnstone, Renfrewshire
 1857 Napier, Dugald, Australia
 1840 Napier, George, Advocate, Sheriff of Peeblesshire, Coates Hall, Edinburgh
 1872 Nares, A. F., Brucktor, Old Meldrum
 1870 Neilson, Joseph, Killimingan, Kirkgunzeon, Dumfries
 1867 Neilson, William, Estate Factor and Banker, Bank of Scotland, Bellshill
 1871 Nelson, Charles, Skateraw, Dunbar
 1859 Nelson, Michael, Hill of Drip, Stirling
 1865 NEPEAN, Sir M. H., of Loders Court, Bart., Bridport
 1845 Newall, John, Mexico
 1838 Newton, Jas. E., of Linnbank, Lanark
 1865 Newton, Captain Hay, of Newton, Ha blington
 1837 Newton, Robert P., of Castlandhill, Polmont Bank, Falkirk
 1872 Newton, T. H. G., Barrels Park, Henley-in-Arden, Birmingham
 1861 Nicholson, Robert, Glencaple, Dumfries
 1867 Nicol, Alex., 39 Marischal Street, Aberdeen
 1869 Nicol, W. E. (of Ballogie, Banchory), 13 Hyde Park Terrace, London, W.
 1841 Nicol, Alexander, late of Edinburgh

Admitted

- 1867 Nicoll, T. Munro, Littleton, Kirriemuir
 1819 Nicholson, Major Allan M., of Armore
 1857 Nicolson, J. Badenach, yr. of Glen-
 bervie, Fordoun
 1857 Nicolson, Neil, Corra, Ardlamont,
 Greenock
 1843 Nielson, A., Bank of Scotland, Glasgow
 1873 Nimmo, Alex., of West Bank, Falkirk
 1852 Nimmo, Matt., Foot of Green, Stirling
 1870 Nisbet, Jas., Lambden, Greenlaw,
 Dunse
 1854 Nisbet, John, Rumbleton, Greenlaw,
 Dunse
 1875 Nisbet, John, Longgreen, Darvel, Kil-
 marnock
 1865 Nisbet, Ralph P., Estate Office, Thor-
 ney, Peterborough
 1847 Nisbett, J. M., of Cairnhill, Drum,
 Edinburgh
 1860 Niven, Alexander T., C.A., 6 Abbots-
 ford Crescent, Edinburgh
 1873 Nivison, Stewart, Lairdlaugh, Dal-
 beattie
 1862 Norie, Henry Hay, W.S., Perth
 1860 Norman, William, Hall Bank, Aspatia
 —Free Life Member 1873
 1867 Norris, Pet., Todholes, Fintry, Stirling
 1843 NORTHEK, Right Hon. the Earl of,
 Ethie House, Arbroath
 1868 OCHTERLONY, Sir Charles Metcalfe, of
 Ochterlony, Bart., St Andrews
 1859 Odams, James, London
 1873 Ogilvie, A. M., Tillynaught, Portsoy
 1854 Ogilvie, Archibald, Old Liston, Ratho
 1820 Ogilvie, Captain William, R.N.
 1853 Ogilvie, Wm. R., Askrigg Hall, Penrith
 1860 Ogilvie, George, Holefield, Kelso
 1868 Ogilvy, Donald, of Clova, 19 Greenhill
 Gardens, Edinburgh
 1870 Ogilvy, Col. James W., Rannagulzion,
 Blairgowrie
 1824 OGILVY, Sir John, of Inverquharity,
 Bart., Baldovan House, Dundee
 1836 Ogilvy, John, of Inshewan, 9 Cham-
 berlain Road, Edinburgh
 1859 Ogilvy, John, Harecraig, Dundee
 1874 Ogilvy, John Francis, yr. of Corri-
 mony, Glen Urquhart
 1871 Ogilvy, Reginald Howard Alexander,
 yr. of Inverquharity, Millhill, Inch-
 ture
 1844 Ogilvy, Lt.-Col. Thomas W., of Ruth-
 ven, Meigle
 1838 Ogilvy, Thos., of Corrimony, Glen-
 Urquhart, Inverness
 1872 Oliphant, L. J., of Condie, Guards'
 Club, London
 1873 Oliphant, Thomas T., of Rossie, Bridge
 of Earn

Admitted

- 1850 Oliver, James, Howpasley, Hawick
 1852 Oliver, James, of Thornwood, Hawick
 1853 Oliver, Robert, of Blakelaw, Lochside,
 Kelso
 1856 Oliver, Thomas, Redheughs, Corstor-
 phine
 1858 Oliver, W. Elliot, Yarrow Cottage,
 Selkirk
 1873 Oliver, Wm. M., Howpasley, Hawick
 1867 ORANMORE and BROWN, Right Hon.
 Lord, Castle Macgarrett, Mayo
 1873 Orr, James, Hill, Whitburn
 1841 Ord, John, of Muirhouselaw, Nisbet,
 Kelso
 1875 Ord, John Robert, Haughton Hall,
 Darlington
 1830 ORDE, Sir J. P., of Kilmory, Bart.
 Lochgilphead
 1858 Orde, Captain John W. Powlett, yr. of
 Kilmory, Auchnaba, Lochgilphead
 1854 ORMIDALE, Hon. Lord, 14 Moray
 Place, Edinburgh
 1848 Ormiston, William T., of Glenburn
 Hall, Jedburgh
 1875 Orr, James, of Harvieston, Dollar
 1848 Oswald, James Townsend, of Dunning-
 kirk, Kirkealdy
 1870 Oswald, Richard A., of Auchincruive,
 Ayr
 1863 Otto, Wm. E., Jedneuck, Jedburgh
 1872 Outhwaite, John, Bainsse, Catterick
 1876 Ovens, William R. (Thos. Ovens and
 Sons) Galashiels
 1852 Pagan, A. C., Rockclyffe, Crieff
 1875 Pagan, G. H., Banker, Cupar Fife
 1872 Panton, Patrick, of Edenbank, Kelso
 1871 Panton, Jn., of Dalnagairn and Carsie,
 Blairgowrie
 1873 Panton, Wm., Maryfield, Blairgowrie
 1874 Park, Ebenezer, Engineer, Greenside
 Lane, Edinburgh
 1863 Park, James, Stoneyhill, Musselburgh
 1873 Park, James D., Engineer, Greenside
 Lane, Edinburgh—Practical Engineer
 to the Society
 1866 Park, Thomas B., Springfield, Had-
 dington
 1874 Park, William, Gallowhill, Paisley
 1857 Parker, J., Nether Broomlands, Irvine
 1867 Parnell, Dr Richard, Gattonside, Mel-
 rose
 1860 Paterson, Alex., Carmacoup, Douglas
 1867 Paterson, Charles, Canford Manor,
 Wimborne
 1864 Paterson, D. A., Merchant, Leith
 1870 Paterson, Dav. J., Watch Hall, Annan
 1877 Paterson, G. R., Drumalbin, Thanker-
 ton, Lanarkshire
 1872 Paterson, Jas., of Kinnettes, Dundee

Admitted

- 1872 Paterson, James, Kidshielhaugh, Dunse
 1853 Paterson, Jas., Whitehouse, Lamlash, Arran
 1860 Paterson, James, of Longbedholm. Carmacoup, Douglas
 1847 Paterson, John, jun., late Kilconan, Campbeltown
 1852 Paterson, John, Macoriston, Thornhill, Stirling
 1857 Paterson, John, Skirling Mains, Biggar
 1860 Paterson, John, Eastfield, Penicuik
 1862 Paterson, John, Howleuch, Moffat
 1870 Paterson, John, Wood of Kirkmichael, Dumfries
 1873 Paterson, John Thomas Scott, Pleau Farm, Bannockburn
 1854 Paterson, J. W., Terrona, Langholm
 1848 Paterson, Robert, of Birthwood, Biggar
 1869 Paterson, Thomas, W.S., 81A George Street, Edinburgh
 1851 Paterson, Walter, Merchant, Glasgow
 1851 Paterson, Wm., Twiglees, Lockerbie
 1870 Paterson, William, of Brocklehirst Mouswald, Dumfries
 1874 Paterson, Wm. Grindlay, Scotsburn, Invergordon
 1865 Paterson, Wm. Innes, Armadale, Thurso
 1873 Paterson, William, Auldtown of Carnousie, Turriff
 1857 Paton, Alex., Norwood, Sydenham, London
 1873 Paton, Jun., of Westbourne, Tilli-coultry
 1859 Paton, John, Standingstone, Haddington
 1833 Paton, John, of Crailing, Kelso
 1841 Paton, John, of Grandholm, Aberdeen
 1873 Paton, Robert, West Drip, Stirling
 1865 Patrick, James, late of Kilmun, Argyllshire
 1873 Patrick, James, Queenzieburn, Kilsyth
 1850 Patterson, John, Balliemore, Strachur
 1851 Patterson, Robert, Cardross, Stirling
 1864 Pattison, A. D., of Dalmuir, Glasgow
 1869 Pattison, George H., Advocate, Sheriff of Roxburgh, Berwick, and Selkirk, 9 Albyn Place, Edinburgh.
 1872 Pattison, J. P., of the Haining, Selkirk
 1861 Pattullo, G., Couparr Grange, Couparr-Angus
 1861 Pattullo, Peter, Eassie Farm, Meigle
 1855 Paul, William, Advocate, Aberdeen
 1854 Pearson, Andrew A., of Springfield, Carluke
 1863 Pearson, David A., Johnston Lodge, Laureneckirk
 1858 Peat, John, Manor, Stirling
 1872 Peddie, John Dick, Architect, 33 Buckingham Terrace, Edinburgh

Admitted

- 1867 Peile, H. R. B., Mansion House, Greenock
 1864 Pelham, C. Thursby, Cound Hall, Shrewsbury
 1871 Pender, Chas. P., Glenferness Mains, Dunphail
 1857 Pender, George, 5 Winton Terrace, Crosshill, Glasgow
 1865 Pender, John Menzies, Glenferness Mains, Dunphail
 1869 Pender, John, M.P., 18 Arlington Street, London, S.W.
 1869 Pender, J., Springhill, Stane, Motherwell
 1868 Penman, John, Bonally, Colinton
 1859 Penny, Thomas, Bartlehill, Coldstream
 1873 Pennycook, William, Wester Logie, Dunkeld
 1854 Peter, Charles, Canterland, Montröse
 1854 Peter, John, Croyard, Beaully
 1875 Peterkin, Jas. Grant, of Grange, Forres
 1871 Petrie, George, Easter Suddie, Avoch
 1868 Petrie, James, Banker, Dufftown
 1871 Petrie, Stephen F., 350 Leith Walk, Edinburgh
 1870 Petrie, William, Kirkhill, Elgin
 1876 Petrie, W. A., Rosebrae, Elgin
 1875 Pettigrew, James, Cairnhill House, Airdrie
 1856 Philip, George, Boynds, Keith Hall, Inverurie
 1851 Philip, John, Polton East Mains, Lasswade
 1858 Philip, W., Lofthillock, Keith Hall, Inverurie
 1860 Phillips, Hugh, Cracrop, Stapleton, Carlisle
 1864 Philp, Robert, Royal Hotel, Bridge of Allan
 1876 Picken, Thomas, Barsallock, Port William
 1857 Picken, James, Laigh Langside, Craigie, Kilmarnock
 1857 Picken, Captain Jas. H., of Hillhouse, Lodge, Fenwick
 1857 Picken, John, Mansfield Mains, New Cumnock
 1860 Picken, R., Barnkirk, Newton-Stewart
 1855 Pirie, James, Waterton, Ellon
 1868 Pirie, T., Kimmundy, Longside, Aberdeen
 1871 Pirrie, Jas. P., Coachbuilder, Perth
 1873 Pitblado, Charles B., Colton Mains, Dunfermline
 1863 Piteairn, John, 22 Queen Street, St Andrews
 1859 Pitman, Frederick, W.S., 11 Great Stuart Street, Edinburgh
 1859 Pittendrigh, A., Mains of Park, Lonma

Admitted	Admitted
1871 Playfair, George G., Eltham Place, Lee, Kent	1867 Purdie, George, Muirhouse, Carnwath
1859 Plenderleith, A., Moorfoot, Gorebridge	1872 Purdom, Walter, East Wooden, Eckford, Kelso
1842 Plummer, Charles Scott, of Sunderland Hall, Selkirk	1861 Purves, James, Lochend, Thurso
1860 Plummer, J., 11 Bruntsfield Place, Edinburgh	1871 Purves, Thomas, Rhifail, Bettyhill, Thurso
1841 Pollexfen, James R., of Cairston, W.S., Edinburgh	1869 Purves, William, Thurdistoft, Thurso
1844 Pollok, Allan, of Faside, Newton, Mearns	1844 Purvis, John, of Kinaldy, St Andrews
1873 Pollok, John, of Blackhouse, Mearns	1869 QUEENSBERRY, Most Noble the Marquis of, Kinmount, Annan
1863 POLWARTH, Right Hon. Lord, Mertoun House, St Boswells	1872 Rae, Robt., Burnbank, Foulden, Berwick-on-Tweed
1877 Pople, George, Newhouse, Perth	1860 Rae, William, Gateslack, Thornhill
1867 Pople, H. W., Royal British Hotel, Perth	1870 Rain, William, Kempleton, Castle Douglas
1861 Pople, J. B., of Newhouse, Perth	1867 Raines, Thomas, Bridgehaugh, Stirling
1870 Porteous, John, Whim, Lamancha	1838 Rait, D. C., Goldsmith, Glasgow
1877 Porter, George, jun. 27 Wellington Place, Aberdeen	1867 Ralston, Andrew W., Lagg, Ayr
1855 Porter, James, Factor, Monymusk, Aberdeen	1868 Ralston, Andrew, Glamis, Forfar
1854 Pott, Gideon, of Knowsouth, Jedburgh	1870 Ralston, A. R., Genoch, Straiton, Maybole
1867 Potter, James, of Glenfuir, Falkirk	1871 Ralston, James J., Old Faskally, Pitlochry
1863 Potts, Andrew, Lewinshope, Selkirk	1876 RAMSAY, Right Hon. Lord, Dalhousie Castle, Bonnyrigg
1861 Powrie, Archibald, Lairwell, Perth	1869 Ramsay, Alex., <i>Banffshire Journal Office</i> , Banff
1849 Powrie, James, of Reswallie, Forfar	1871 RAMSAY, Sir James Henry, of Bamff, Bart., Alyth
1864 Prentice, George, of Strathore, Newbigging, Burntisland	1856 Ramsay, John, of Kildalton, M.P., Port Ellen, Greenock
1865 Prentice, R. R., Skeddoway, Kirkealdy	1875 Ramsay, John, Butcher, Kilbarchan
1875 Preston, W. C., Achonachie, Beauldy	1856 Ramsay, Col. John, of Barra, Straloch, Aberdeen
1873 Pretsell, James, Drummelzier Place, Rachan Mill, Biggar	1841 Ramsay, Robert B. Wardlaw, of Whitehill, Lasswade
1863 Primrose, James Thomson, Sauchland, Ford	1837 Ranken, George, Australia
1875 Pringle, Adam T., 6 India Buildings, Edinburgh	1874 Ranken, John, Ballencrieff Mains, Longniddry
1859 Pringle, Alexander, of Whytbank, Selkirk	1866 Rankin, George, Union Bank, Aberfeldy
1863 Pringle, David, of Wilton Lodge, Hawick	1876 Rankine, Alex. M., yr. of Beoch, Lochlands, Maybole
1863 Pringle, David, Cleethaugh, Jedburgh	1874 Rankine, John, of Bassendean, 6 India Street, Edinburgh
1876 Pringle, James, 1 Bellevue Place, Edinburgh	1857 Rankine, John, of Beoch, Lochlands Maybole
1863 Pringle, James Thomas, of Torwoodlee, Galashiels	1875 Rankine, Patrick, M. D., Willow Bank, Airdrie
1865 Pringle, John, Garvald, Gorebridge	1868 Rankine, R. W., Rosebank, Falkirk
1852 Pringle, Robert K., The Grove, Darley Dale, Matlock	1859 Rannie, M. G., Edenmouth, Kelso
1868 Proudfoot, T., Pinkiehill, Musselburgh	1868 Rate, George, Mungoswells, Drem
1870 Pullar, John, Perth	1854 Rattray, Col. J. C., of Craighall, Blairgowrie
1864 Pullar, John, jun., Keirfield. Bridge of Allan	1874 Rattray, James Clark, M.D., of Coral Bank, Blairgowrie
1871 Pullar, Robert, Perth	
1871 Pullar, William, Kingussie	
1865 Punton, F. H., West Fortune, Drem	

Admitted

- 1856 Rawdin, Joseph, Chemist, Jedburgh
 1870 Rawline, J. D., Raglan Castle, Raglan
 1854 Ray, William, Sunbank, Elgin
 1863 Rea, Charles, Doddington, Wooler
 1874 Reddie, Captain John Griffiths, of Redhouse, Rickarton House, Stonehaven
 1857 Redfern, W. Macquarrie, London
 1864 Reekie, A., Walton, Auchtertool, Kirkcaldy
 1872 Reekie, Wm., Carterhaugh, Selkirk
 1857 Reid, Alexander, Cruivie, Cupar
 1873 Reid, Alexander, Architect, Elgin
 1844 Reid, Charles G., W.S.
 1876 Reid, Donald, Donavoured, Pitlochry
 1871 Reid, Duncan, Migvie, Tarland
 1867 Reid, F. R., of Gallowilat, Rutherglen
 1858 Reid, George, Seedsman, Aberdeen
 1874 Reid, George, Baads of Drum, Peterculter, Aberdeen
 1876 Reid, George, jun., Clinterty, Blackburn, Aberdeen
 1871 Reid, George, of Tilliery, Milnathort
 1855 Reid, James, Sommerfield, Haddington
 1872 Reid, Dr J. B., Aberfeldy
 1857 Reid, J., Corsebank, Sanquhar
 1858 Reid, James, Greystone, Alford
 1876 Reid, James, Horse Bazaar, Peterhead
 1873 Reid, James, Kilmundie, Glamis
 1867 Reid, James R., Woodburn, Rutherglen
 1875 Reid, James, Inchberry, Inverness
 1869 Reid, J., Sanquhar, Gartly, Huntly
 1859 Reid, John, Ingrie, Leslie
 1870 Reid, John James, Advocate, Alva Street, Edinburgh
 1876 Reid, Peter, Crofts of Glennuick, Ballater
 1850 Reid, Walter, Drem
 1864 Reid, Walter, Craigarnhall, Bridge of Allan
 1871 Reid, William, Pittentian, Crieff
 1871 Reith, James, South Auchincleeh, Skene, Aberdeen
 1876 Reith, Robert, Middlefield, Woodside Aberdeen
 1872 Renwick, John, Nurseryman, Melrose
 1873 Renny, Thomas, of Dundarroch, Pitlochry
 1859 Reoch, J. F., 39 Inverleith Row, Edinburgh
 1873 Richardson, Alex., Castleton, Gorebridge
 1863 Richardson, D., of Hartfield, Glasgow
 1874 Richardson, George, 89 Wilson Street, Glasgow
 1861 Richardson, Captain James T. Stewart, yr. of Pittfour, Perth
 1823 RICHARDSON, Sir John S., of Pittfour, Bart., Perth

Admitted

- 1873 Richardson, John, Brunton Place Carlisle
 1851 Richardson, John, Writer, Haddington
 1863 Richardson, J., Mainshill, Haddington
 1837 Richardson, Robert, 16 Bruntsfield Place, Edinburgh
 1863 Richardson, R., Crailingnook, Jedburgh
 1840 RICHMOND and GORDON, His Grace the Duke of, K.G., Gordon Castle, Fochabers
 1861 Richmond, G., of Balhaldie, Lawhill, Auchterarder
 1861 Richmond, John, Dron, Bridge of Earn
 1871 Richmond, T., Hilton, Perth
 1831 Rickman, Thomas, late Architect, Birmingham
 1863 Riddell, David, Blackhall, Paisley
 1854 Riddell, Thomas, of Menslaws, Jedburgh
 1845 RIDDELL, Sir T. M., of Sunart, Bart., Strontian
 1852 Riddell, William, Hundalee, Jedburgh
 1863 Riddell, William, Howford, Peebles
 1861 Rigg, Wm., Banks, Kirkcudbright
 1877 Rignall, James, Agricultural Implement Agent, 35 George IV. Bridge, Edinburgh
 1871 Rintoul, Alexander, Ardnò, Cairndow
 1852 Rintoul, Charles, Kingston, North Berwick
 1861 Rintoul, D., Mains of Blebo, Cupar-Fife
 1865 Rintoul, Robert, of Lahill, Largo
 1873 Risk, Robert, Drumbræ, Bridge of Allan
 1869 Ritchie, Charles, S.S.C., 31 Howard Place, Edinburgh
 1865 Ritchie, Charles, late Ladoga Lodge, Musselburgh
 1863 Ritchie, James, 140 High Street, Edinburgh
 1857 Ritchie, John, Newbigging Mains, Carnwath
 1867 Ritchie, John, Whitecastle, Biggar
 1872 Ritchie, Robert, Cloverhill, Biggar
 1853 Ritchie, W., Spott, Dumbar
 1852 Ritchie, Wm., Pleam Mill, Stirling
 1865 Ritchie, W., of Middleton, Gorebridge
 1863 Robertson, And., Hoscawbank, Kelso
 1841 Robertson, James, Kelso
 1863 Robertson, John, jun., Harperton, Kelso
 1863 Robertson, Robert, Ladyrig, Kelso
 1873 Roberts, James, Lumgair, Stonehaven
 1871 Robertson, Mrs., sen., of Struan, Rannoch
 1876 Robertson, Alex., Tochenford, Pitcairney, Aberdeen

Admitted

- 1856 Robertson, A. F., Ardlaw, Fraserburgh
 1839 Robertson, Alexander Inglis, Aultnas-
 kiach, Inverness
 1869 Robertson, Rev. A. Irvine (of Kind-
 rochet), Aberdeen
 1875 Robertson, Andrew, Grougfoot, Lin-
 lithgow
 1832 Robertson, Andrew, M.D., of Hopewell,
 Tarland
 1840 Robertson, Arthur John, Culcabock
 House, Inverness
 1860 Robertson, Dr Charles, Auchtercairn,
 Gairloch
 1869 Robertson, C., of Kindeace, Inver-
 gordon
 1861 Robertson, David, Cloag, Methven,
 Perth
 1847 Robertson, David Souter, of Whitehill,
 Cookston Park, Brechin
 1854 Robertson, Donald, of Pennyghael, 73
 Great King Street, Edinburgh
 1876 Robertson, Duncan, yr. of Pennyghael,
 73 Great King Street, Edinburgh
 1864 Robertson, D. G., of Torrie, Callander
 1871 Robertson, D. A. C., North Dowald,
 Abercairnry, Crieff
 1876 Robertson, George, of Hedderwick,
 C.E., 47 Albany Street, Edinburgh
 1860 Robertson, George B., Berwick-on-
 Tweed
 1836 Robertson, James, 27 Albert Place,
 Stirling
 1859 Robertson, J., Denbrae, Cupar-Fife
 1872 Robertson, James, 96 Catherine Street,
 Whitehaven
 1870 Robertson, James A. (late Chapel Park,
 Kingussie), Virginia, U.S.
 1876 Robertson, Major James C., Whitefield,
 Govan
 1873 Robertson, James F., New Mains,
 North Berwick
 1874 Robertson, James Hope, Biel Grange,
 Prestonkirk
 1851 Robertson, James Stewart, W.S., of
 Edradynate, Ballinluig
 1876 Robertson, James Stewart, yr. of
 Edradynate, Ballinluig
 1876 Robertson, John, Auchnahyle, Pit-
 lochry
 1874 Robertson, John, of Grishernish, Por-
 tree
 1855 Robertson, John, Mount Abundance,
 Queensland
 1854 Robertson, J., Glencripisdale, Stron-
 tian
 1870 Robertson, John, West Mitchellton,
 Lochwinnoch
 1864 Robertson, J., Old Blair, Blair-Athole
 1867 Robertson, J., Bellaty, Glenisla, Alyth
 1874 Robertson, John, of Rhyynie, Fearn

Admitted

- 1856 Robertson, John, 68 Bath Street,
 Glasgow
 1873 Robertson, John S., Fernlea, New
 Kilpatrick
 1857 Robertson, Neil, Balquhain, Alex-
 andria
 1872 Robertson, Peter, Achilty, Dingwall
 1872 Robertson, Peter, Coleraine, Ireland
 1870 Robertson, Peter D., late Etteridge,
 Kingussie
 1862 Robertson, Peter S., Trinity Nursery,
 Trinity, Edinburgh
 1847 Robertson, Major-General Richardson,
 of Tullybelton, C.B., Bankfoot
 1872 Robertson, Robert, West Barns, Dun-
 bar
 1876 Robertson, Robt. Wm., of Glenshillish,
 Rockingham, Kilcreggan
 1861 Robertson, Stewart Souter, yr. of
 Whitehill, London
 1859 Robertson, W. M., of Gartloch, 25
 Kersland Street, Hillhead, Glasgow
 1874 Robertson, William, Burnside, Ballin-
 dalloch
 1857 Robertson, Wm., Cuttlebrae, Foch-
 abers
 1863 Robertson, William, V.S., Kelso
 1870 Robertson, William A., Abbotsbill,
 Forres
 1872 Robeson, George, Brotherston, Kelso
 1863 Robeson, R., Springwells, Coldstream
 1859 Robey, Robert, Engineer, Lincoln
 1851 Robinow, Adolph, 21 Clarendon Cre-
 scent, Edinburgh
 1876 Robinson, James W., 125 St Ann
 Street, Liverpool
 1871 Robison, Robert, Castlehill, Inch-
 ture
 1841 Robson, Charles, Lurdenlaw, Kelso
 1863 Robson, Charles, jun., Lurdenlaw,
 Kelso
 1853 Robson, John, Byreiness, Rochester
 1874 Robson, John, jun., Byreiness, Rochester
 1851 Rodger, David, Penkiln, Garlieston
 1859 Rodger, Peter, Selkirk
 1838 Rodger, R., Hadlow Castle, Tunbridge
 1865 Rodger, Robert M., Estate Factor,
 Royal Bank, Airdrie
 1873 Rodgie, Henry, Rothes Estate Office,
 Leslie, Fife
 1857 Rodger, Hugh, Hillhead, Kilmarnock
 1862 Rogers, James S., Rose Mill, Dundee
 1851 Rogerson, G., of Pearseby Hall,
 Pumplaburn, Moffat
 1864 Rogerson, James, of Gillesbie, Wam-
 phray, Lockerbie
 1837 Rolland, Adam, of Gask, 20 Athole
 Crescent, Edinburgh
 1857 RolLo, Right Hon. Lord, Duncrub
 House, Dunning

Admitted

- 1869 Ronald, J., S.S.C., Fernieside House, Liberton
 1857 Ronaldson, Alexander, Glasgow
 1860 Rome, R. M., Ruggetshaws, Langholm
 1873 Rome, Thos., M.R.A.C., Northampton Downs, Barcoo River, Queensland—
Free Life Member
 1863 Romanes, Robt., of Harryburn, Lauder
 1869 Rorrison, John, Dumfries
 1869 Rose, Hugh, Solicitor, Inverness
 1875 Rose, Rev. Hugh Francis, of Holme Rose, Fort-George Station
 1865 Rose, Jas., Mains of Connage, Fort-George Station
 1865 Rose, John, Leanach, Inverness
 1865 Rose, Major James, of Kilravock, Nairn
 1854 Rose, William, Sheriffston, Elgin
 1868] ROSEBERRY, Right Hon. the Earl of, Dalmeny Park, Edinburgh
 1875 Ross, Alexander, Oldtown, Tarland
 1864 Ross, David, Banker, Dingwall
 1864 Ross, D. G., Merchant, Dingwall
 1874 Ross, Duncan, Hilton, Inverness
 1872 Ross, George, Merchant, Dingwall
 1839 Ross, George, of Pitcalnie, Parkhill
 1865 Ross, G., Braelangwell, Invergordon
 1849 Ross, Lieut.-Colonel George W. H., of Cromarty
 1876 Ross, James, Balblair, Edderton
 1870 Ross, James, M.D., Linksfield, Elgin
 1863 Ross, James, Newton-lees, Kelso
 1871 Ross, James E., Factor, Abercairny, Crieff
 1858 Ross, H., jun., Union Bank of Scotland, Tarland
 1870 Ross, John, The Grove, Ravenglass, Carnforth
 1874 Ross, John, Meikle Tarrel, Fearn
 1843 Ross, John Leith, of Arnage, Ellon
 1871 Ross, Peter, Arngrove, Torphins
 1856 Ross, Thomas, Bachilton, Perth
 1871 Ross, William, Amesley, Torphins
 1857 ROSSLYN, Right Hon. the Earl of, Dysart House, Kirkcaldy
 1870 Rough, Robert, Wellford, Broxburn
 1850 Ronghead, D., Seedsman, Haddington
 1870 Rontledge, Wm., Erig, Port-William
 1857 Rowan, J. M., Atlas Works, Glasgow
 1871 Roxburgh, Robert, Seed Merchant Kinross
 1837] ROXBURGH, His Grace the Duke of, K.T., Floors Castle, Kelso
 1856 Roy, Alex., Waterton, Inch, Aberdeen
 1871 Roy, Fred. Lewis, of Nenthorn, Kelso
 1871 Roy, Thomas, Bullendrick, Bridge of Earn
 1856 Royds, Robert Whyt, late Balgeddie, Kirkcaldy
 1846 Russell, Alexander James, C.S., 9 Shandwick Place, Edinburgh

Admitted

- 1854 Russell, Andrew Walker, of Kenlygreen, St Andrews
 1867 Russell, A., Wishaw House, Lanarkshire
 1854 Russell, Arthur, Royal Bank, Cupar Fife
 1859 Russell, David, Silverburn, Leven
 1835 Russell, Francis Whitworth, late Bengal Civil Service
 1851 Russell, James M., Greendykes, Tranent
 1847 Russell, Dr James, of Breconside, Holmhill, Thornhill
 1875 Russell, James, National Bank, Airdrie
 1869 Russell, James, Parbroath, Cupar-Fife
 1862 Russell, John, Saughton Hall Mains, Murrayfield
 1864 Russell, Lewis, Conon Bridge, Dingwall
 1834 Russell, Robert, Edinburgh
 1853 RUSSELL, Sir William, of Charlton, Bart., Gloucester
 1858 Rust, James, Paddocklaw, Banff
 1872 Rutherford, Andrew, Rumbleton Law, Gordon
 1860 Rutherford, George, Monteath's Houses, Gorebridge
 1863 Rutherford, G., Printonan, Coldstream
 1863 Rutherford, Geo., of Seaur, Jedburgh
 1874 Rutherford, Dr James, Woodilee Asylum, Lenzie
 1861 Rutherford, John, Cromwell Park House, Perth
 1871 Rutherford, R., Invereshie, Kingussie
 1825 Rutherford, William Oliver, of Edgerston, Jedburgh
 1863 Rutherford, William A. Oliver, yr. of Edgerston, Jedburgh
 1854 Ruxton, Andrew, South Arbroath, Ellon
 1851 Ruxton, John, M.D., Hill of Fiddes, Culter Cullen, Aberdeen
 1850 Ruxton, William, West Mains of Colliston, Arbroath
 1870 Ryrie, Robert, 34 Park Street, Grosvenor Square, London
 1864 Sadler, Daniel B., late Balmuick, Crieff
 1853 Sadler, William, 25 Union Grove, Clapham, S.W.
 1869 Saffley, John, of Mornington, Dumfries
 1873 ST CLAIR, the Hon. the Master of, Guttonside House, Melrose
 1856 Salmon, J., The Linn, Johnstone
 1871 Salmund, David S., Mains of Errol, Errol
 1858 Salmund, James, Cairnie, Arbroath
 1868 Salmund, R., Nether Balfour, Durris

Admitted

- 1845 Salmond, Robert, late Banker, Glasgow
 1854 SALFOUN, Right Hon. Lord, Philorth House, Fraserburgh
 1875 Sandeman, Alex. B., Huntingtowerfield, Perth
 1875 Sanderson, James, Dykefoot, Carnwath
 1864 Sanderson, William, Corstorphine Bank, Corstorphine
 1855 SANDILANDS, Hon. James, 31 Princes' Gate, London
 1876 Sandison, Alex., Uyasound, Unst
 1873 Sands, James, Milton, Burn of Cambus, Stirling
 1870 Saunders, R. B., Chapelhill, Kirkcudbright
 1843 Searth, Robert, of Binscarth, Finstown, Orkney
 1851 Seobie, John, Lochinver, Golspie
 1875 Seobie, Neil M., Mid Fearn, Ardgay
 1854 Soon, Kenneth, 46 Rankeillor Street, Edinburgh
 1850 Scott, Alex., Beanston, Haddington
 1869 Scott, A., Society House, Hopetoun, South Queensferry
 1876 Scott, Alexander, Towie Barelay, Aberdeen
 1875 Scott, Alex., Cauldoats, Liberton
 1848 Scott, Andrew, Glendouglas, Jedburgh
 1875 Scott, Andrew, Balnakiel, Durness, Laig
 1876 Scott, Andrew T. S., of Crosswoodhill, 20 Walker Street, Edinburgh
 1864 SCOTT, Right Hon. Lord Charles, Dalkeith
 1857 Scott, C., Newtonlees, Dunbar
 1859 Scott, D., 3 Craig Street, Montrose
 1849 Scott, D., Meadowfield, Duddingston, Edinburgh
 1866 Scott, D. G. C., Parks of Inshes, Inverness
 1863 Scott, George, Mosstower, Kelso
 1861 Scott, Gideon James, Hyndhope, Selkirk
 1861 SCOTT, Right Hon. Lord Henry, M.P., Dalkeith
 1859 Scott, Hercules, of Brotherton, Bervie
 1846 Scott, Hugh, of Gala, Galashiels
 1868 Scott, James, Bogton, Torrance of Campsie
 1850 Scott, Jas., 1 Woodside Place, Glasgow
 1862 Scott, James, Easter Tulloch, Stonehaven
 1876 Scott, James Bruce, Wester Rora, Longside
 1870 Scott, Major-Gen. Jas. C., United Service Club, Edinburgh
 1873 Scott, James G., Hill of Ruthven, Perth
 1863 Scott, Dr James Robson, of Ashtree, Yetholm
 1826 Scott, J., Finnart House, Greenock

Admitted

- 1870 Scott, John, Clebrig, Laigs
 1874 Scott, John, Noss, Wick
 1877 Scott, John Lindsay, of Mollance, Castle-Douglas
 1863 Scott, John Scott Elliot, Buckholm, Galashiels
 1868 Scott, John, Springfield House, Uddingston
 1868 Scott, Malcolm, Balmuildy, Bishopbriggs
 1872 Scott, Peter, Chirnside Crofts, Chirnside
 1841 Scott, Captain Robert, late H.E.I.C.S.
 1872 Scott, Ralph Erskine, C.A., 25 Melville Street, Edinburgh
 1863 Scott, Robert, Kinninghall, Hawick
 1874 Scott, Robert, Easter Manbeen, Elgin
 1873 Scott, Robert, Yokieshill, Mintlaw
 1875 Scott, Robert Sinclair, Craigievar, Wemyss Bay
 1871 Scott, Thos., Gateside, Bridge of Earn
 1876 Scott, Thomas, Iron Merchant, Grassmarket, Edinburgh
 1863 Scott, T., Whitten, Kelso
 1860 Scott, T. Robson, of Newton, Jedburgh
 1861 SCOTT, Right Hon. Lord Walter, Dalkeith
 1850 Scott, Walter, Glendronach, Huntly
 1863 Scott, W., Oxnam Nook, Jedburgh
 1857 Scott, Wm., Spylaw, Kelso
 1855 Scott, William, Wester Rora, Mintlaw
 1862 Scott, William, of Burnside, Alyth
 1875 Scott, William, Condorrat, Airdrie
 1863 Scott, William, Howford, Ettrick, Selkirk
 1857 Scott, William, Urquhart Road, Old Meldrum
 1868 Scott, William, Cononsyth, Arbroath
 1863 SCOTT, Sir William Monteath, of Ancrum, Bart., Jedburgh
 1872 Scoular, John, Crook, Stirling
 1842†SEAFIELD, Rt. Hon. the Earl of, Cullen House, Cullen
 1875 Seatter, William, Saviskail, Rousay, Orkney
 1872 Selby, B. P., Paston, Coldstream
 1872 Selby, Robt., Hassendean Bank, Denholm, Hawick
 1863 Selby, Ephraim, Hassendean Bank, Hawick
 1830†SELKIRK, Right Hon. the Earl of, St Mary's Isle, Kirkcudbright
 1871 Sellar, Alex. G., Ironmonger, Elgin
 1849 Sellar, P. Plenderleith, Hartfield, Tain
 1868 Sellar, R., Implement Maker, Huntly
 1857 Sempill, John, late Ballemenach, Campbelltown
 1868 Semple, John, Haughs of Kinnaird, Brechin

Admitted

- 1857 Semple, Thos., Carradale, Campbelltown
 1877 Semple, William, Mouswald Banks, Dumfries
 1848 Seton, George, Advocate, 42 Greenhill Gardens, Edinburgh
 1859 Seton, Henry, V.S., Tollerross, Edinburgh
 1834 SETON, Sir W. Coote, of Pitmedden, Bart., Aberdeen
 1873 Shairp, William, Almond Bank, Broxburn
 1863 SHAND, Hon. Lord, New Hailes, Musselburgh
 1868 Shand, George, Ordens, Boyndie, Banff
 1870 Shand, John, M.D., Oakley House, Kirkeudbright
 1864 Shand, William, New York
 1846 Sharp, James, Helensburgh
 1871 Sharp, Peter, Bardrill, Blackford
 1871 Sharp, Thomas, Clathymore, Auchterarder
 1835 Shaw, Charles, W.S., Spanish, Lochmaddy
 1872 Shaw, Chas. G., Dumfries Estate Office, Cumnock
 1850 Shaw, Hary, Bogfern, Tarland
 1863 Shaw, James, Skaithmuir, Coldstream
 1868 Shaw, James, Tillyching, Lumphanan
 1861 Shaw, William, Finegand, Glenshee, Blairgowrie
 1838 Shawe, R. F., of Lotherton Hall, South Milford, Yorkshire
 1877 Shearer, James, Mains of Croy, Fort-George
 1857 Shennan, James, Balig, Kirkeudbright
 1844 Shepherd, George, Shethin, Tarves
 1865 Shepherd, George, jun., Craigie, Tarves
 1875 Sheriff, J., jun., Queen's Hotel, Glasgow
 1864 Sherriff, John Bell, Carronvale, Larbert
 1872 Shiel, And., Impt. Dealer, Coldstream
 1869 Shield, George, Chemist, Arbroath
 1877 Shields, James, Byers, Bathgate
 1871 Shields, John, Wallace Works, Perth
 1866 Shiels, George, Balgove, St Andrews
 1847 Shirriff, David, Muirton, Drem
 1850 Shirriff, Samuel D., Salteoats, Drem
 1854 Shortreed, R., Attonburn, Yetholm
 1877 Sidey, James, Gourdie, Dunkeld
 1873 Sievwright, Wm., National Bank, Lerwick
 1866 Sim, Alexander, Fawells, Inverurie
 1870 Sim, Henry, Cattle-Salesman, Inverness
 1875 Sim, John Fraser, Oban
 1858 Sim, William, 4 St Bernard's Crescent, Edinburgh
 1871 Sime, And., Balgay, Inchture
 1873 Sime, Peter W., 16 George Street, Edinburgh
 1830 Simpson, Alex. Horatio, late Hayes, Uxbridge

Admitted

- 1860 Simpson, Alex., Smeaton, Dalkeith
 1853 Simpson, George, Bedrule, Jedburgh
 1868 Simpson, George, South Burrellesdales, Alvalh, Banff
 1869 Simpson, George, 2 Lauder Road, Edinburgh
 1851 Simpson, James, Mawcarse, Milnathort
 1875 Simpson, John, South Colmae, Rothersay
 1876 Simpson, John (Auchinachie & Simpson), Keith
 1839 Simpson, Robert, of Cobairdy, Huntly
 1874 Simson, C. S., of Threepwood, 6 India Street, Edinburgh
 1861 Simson, George, Courthill, Kelso
 1871 Simson, Thos., Skelpie, Cupar
 1839 Sinclair, A., 133 George Street, Edinburgh
 1859 Sinclair, Arch., Minard, Inverary
 1863 Sinclair, David, Loirston, Aberdeen
 1872 Sinclair, Duncan, Tullygarth, Alloa
 1876 Sinclair, James, Cairnbeddie, Balbeggie, Perth
 1857 SINCLAIR, Sir J. G. T., of Ulbster, Bart., M.P., Thurso Castle, Thurso
 1875 Sinclair, John, Auchenreir, Taynult
 1869 Sinclair, Peter, Kilmartin
 1864 SINCLAIR, Sir Robert C., of Stevenson, Bart., Achvarslale Lodge, Reap, Thurso
 1872 Sinclair, W.S. Thomson, of Freswick, Dunbeath Castle, Caithness
 1850 Sivewright, James, The Grove, Torquay
 1876 Skeen, George, Mill of Gellan, Coull, Aboyne
 1876 Skeen, John, Commercial Inn, Tarland
 1831 Skene, William F., W.S., 20 Inverleith Row, Edinburgh
 1823 Skinner, Capt. C. G. Macgregor, Carisbrooke House, Isle of Wight
 1859 Skinner, James, Woodsid, Aberdeen
 1869 Skinner, W., of Corra, W.S., City Clerk, 35 George Square, Edinburgh
 1874 Skinner, Wm. M., Drumin, Ballindalloch
 1857 Skirving, Adam, of Croys, Dalbeattie
 1850 Skirving, James, Luffness Mains, Drem
 1846 Skirving, R. Scot, 29 Drummond Place, Edinburgh
 1858 Sleigh, John, Land-Surveyor, Strichen Mains, Strichen
 1863 Slipper, R. B., 427 New Cross Road, London, S.E.
 1861 Sloan, D., Coachbuilder, Dumfries
 1870 Sloan, John, Barnhill, Patna, Ayrshire
 1869 Sloan, William, Bricyside, Monkton, Ayr
 1877 Small, James, Banker, Galashiels
 1843 Small, David, Writer, Dundee
 1859 Small, Jas., of Dimnanean, Pitlochry

Admitted

- 1870 Small, John L., of Foodie, St Andrews
 1857 Small, Lindsay, Orry's Mount, Ramsey, Isle of Man
 1864 Smart, James, Liberton Park, Liberton
 1858 Smart, John, late Glasgowewo, Blackburn, Aberdeen
 1873 Smeaton, Rev. John (of Coull), Tullialan Manse, Kincardine, Alloa
 1870 Smellie, Henry, West Edge, Liberton
 1857 Smith, Adam, Stevenson Mains, Haddington
 1877 Smith, Alex., Barnford, Dalrymple, Ayr
 1847 Smith, Alex., C.E., 28 Market Street, Aberdeen
 1852 Smith, Alexander (A. & W. Smith & Co.), Westbourne, Govan, Glasgow
 1863 Smith, Alexander, Letham, Berwick
 1864 Smith, Alexander P., Munloch Farm, Munloch
 1856 Smith, Andrew, Castle Mains, Douglas
 1864 Smith, Andrew, Solicitor, Dingwall
 1858 Smith, Andrew, Castle Mains, Gifford
 1874 Smith, Archibald Haddow, 1 India Buildings, Edinburgh
 1853 Smith, C., Whittinghame, Prestonkirk
 1876 Smith, Chas., 36 Howard Street, Glasgow
 1836 Smith, C. H. Johnstone, late Edinburgh
 1833 Smith, David, W. S., 10 Eton Terrace, Edinburgh
 1876 Smith, D. W. E., Coalston Mains, Haddington
 1830 Smith, E. B., of Blackwood House, Ecclefechan
 1864 Smith, F. C., Hoprig, Cockburnspath
 1862 Smith, George, 20 Lynedoch Street, Glasgow
 1872 Smith, G. P., Crooks, Coldstream
 1853 Smith, Major H., of Cruickfield, Dunse
 1857 Smith, Hugh, 9 Kelvinside Terrace North, Glasgow
 1855 Smith, James, of Olig, Thurso
 1857 Smith, James, Broomhill, Partick
 1857 Smith, Jas., 26 Dundas Street, Edinburgh
 1859 Smith, James, 11 Dixon St., Glasgow
 1869 Smith, J. Mullochard, Ballindalloch
 1872 Smith, Jas. F., Fireburn Mill, Coldstream
 1873 Smith, James, Pittengardner, Fordoun
 1851 Smith, John, Advocate, 265 Union Street, Aberdeen
 1873 Smith, John, Balmaln, Fettercairn
 1874 Smith, John, Cragganmore, Ballindalloch
 1865 Smith, John, Inverallan House, Grantown
 1874 Smith, John, Westmains of Campfield, Banchory

Admitted

- 1852 Smith, J. Gordon, Minmore, Ballindalloch
 1870 Smith, J. P., C.E., Glasgow
 1867 Smith, J. Turnbull, C.A., 29 St Andrew Square, Edinburgh
 1872 Smith, Peter, Crooks, Coldstream
 1864 Smith, Robert, Brencham Park, Stirling
 1877 Smith, Robert, Gamerig, Dumfries
 1872 Smith, Robt. G., Almond Bank, Mid-Calder
 1854 Smith, R.M., 4 Bellevue Crescent, Edinburgh
 1874 Smith, Sidney, Mill of Boyndie, Banff
 1850 Smith, Thomas, Dalnibble, Dumfries
 1873 Smith, Thomas, Dunnabie, Lockerbie
 1874 Smith, Thomas, Raitloan, Nairn
 1870 Smith, Thomas, Ladyland, Dumfries
 1854 Smith, Wm., Melkington, Cornhill, Northumberland
 1856 Smith, Wm., West Drums, Brechin
 1858 Smith, William, Middleton, Balquhairn, Inverurie
 1860 Smith, William, Banker, Moniaive
 1863 Smith, W., Stone of Morphie, Montrose
 1868 Smith, William, New Mains of Urie, Stonehaven
 1869 Smith, Wm., Chanlockfoot, Thornhill
 1873 Smith, Wm. B., Stoneleigh Villa, Leamington—*Free Life Member*
 1874 Smithson, Joseph S., General Manager, W. & H. M. Goulding, 25 Eden Quay, Dublin
 1826 Smollett, A., of Bonhill, Cameron House, Alexandria, N.B.
 1876 Smythe, David M., yr. of Methven, Perth
 1846 Smythe, William, of Methven, Perth
 1857 Snodgrass, Allan, Mollandhu, Cardross
 1857 Somervail, P., Glendevon, Winchburgh
 1857 Somervell, G., of Sorn, Sorn Castle, Mauchline
 1848 Somerville, J., Birch Villa, Peebles
 1858 Somerville, James, S.S.C., 23 South Blasket Place, Edinburgh
 1850 Somerville, Wm., Merchant, Glasgow
 1854 Souter, Alexander, Banff
 1850† SOUTHESK, Right Hon. the Earl of, K.T., Kinnaird Castle, Brechin
 1877 Spalding, Augustus Frederick Montague, of Holme, New Galloway
 1865 Spears, W. R., writer, Kirkcaldy
 1858 Spier, Robert, of South Camphill, Blair Park, Largs
 1873 Spiers, Alex. Graham, of Culcreuch, Fintry, Glasgow
 1838 Spiers, T. Dundas, late Burnfoot, Houston
 1860 Spence, Adam White, Glencairn House, Crieff
 1876 Spence, John, Howldswick, Unst
 1875 Spencer, A., 160 Hope Street, Glasgow

Admitted

- 1872 Spens, James, Low Ardwell, Stranraer
 1872 Spofford, Joseph Louis, Banker, 29 Broadway, New York
 1863 Spowart, T., of Broomhead, 7 Coates Crescent, Edinburgh
 1870 Sproat, Robert, Lennox Plunton, Kirkcudbright
 1830 Sprot, James, of Spot, Dunbar
 1830 Sprot, Mark, of Riddell, Lilliesleaf
 1826 Sprot, Thomas, W.S., 10 Drummond Place, Edinburgh
 1836 Stables, W. A., Braeval, Nairn
 1845+STAIR, Right Hon. The Earl of, K.T., Oxenford Castle, Dalkeith,
 1854 Starforth, John, Architect, 37 York Place, Edinburgh
 1858 Stark, Andrew, Wester Bogie, Kirkcaldy
 1875 Stark, Matthew C., Manse, Gargunnoch
 1862 Stark, Ralph, of Summerford, Camelon, Falkirk
 1870 Stark, Robert, Kirkcaldy
 1861 Stark, W. Williamston, Mid-Calder
 1869 Statter, Thomas, jun., Stand Hall, Whitefield, Manchester
 1872 Stavert, Archd., of Hoscote, 18 Royal Terrace, Edinburgh
 1851 Stedman, J., Wester Ulston, Boundary Bank, Jedburgh
 1862 Steedman, J., late Charleston, Dunfermline
 1870 Steel, Gavin, Holmhead, Lanark
 1871 Steel, Gavin, of Hill Park, 5 Queen Street, Glasgow
 1872 Steel, James, Fallamill, Greenburn
 1853 Steele, Robert, Greenock
 1828 Steele, William, Sheriff-Substitute of Dumbarton
 1874 Steell, Gourlay, R.S.A.—*Animal Portrait Painter to the Society*, 4 Palmerston Place, Edinburgh
 1854 Stegmann, Conrad, late Merchant, Leith
 1850 Stenhouse, J., Southfield, Corstorphine
 1861 Stenhouse, James, Turnhouse, Cramond Bridge
 1876 Stenhouse, James S., of Northfod, Dunfermline
 1858 Stephen, James, Conglass, Inverurie
 1874 Stephenson, Richard, Chapel, Dunse
 1845 Steuart, Andrew, of Auchluncart, Keith
 1857 Steuart, D., of Steuart Hall, Stirling, Herongate, Brentwood, Essex
 1835 STEUART, Sir Henry J. Seton, of Allanton, Bart., Touch, Stirling
 1876 Steuart, H. J. Gow, Fowler's Park, Hawkhurst, Kent
 1842 Steuart, James, W.S., 8 Doune Terrace, Edinburgh

Admitted

- 1864 Steuart, James, junior, Dalkeith Park, Dalkeith
 1823 Steuart, John, of Dalguise, Dunkeld
 1859 Steuart, Patrick, Middlegill, Moffat
 1864 Steuart, Captain Robert, of Westwood, West Calder
 1855 Steuart, Robert, Dundale, Gravesend, Kent
 1833 Steuart, William, London
 1839 Stevenson, Alexander, Banker, Langholm
 1875 Stevenson, Alex. Shannan, Auchineilan, Lochgilphead
 1855 Stevenson, Andrew, Halls, Dunbar
 1853 Stevenson, David, F.R.S.E., Member of the Institution of Civil Engineers, Consulting Engineer to the Society, 84 George Street, Edinburgh
 1853 Stevenson, John B., New Zealand
 1864 Stevenson, John, Changue, Cumnock
 1860 Stevenson, Robert, late Banker, Edinburgh
 1852 Stevenson, Thomas, Mount-Lothian, Penicuik
 1877 Stevenson, William, Holland, Stronsay, Kirkwall
 1876 Stevenson, William, of Viewfield, Aberdeen
 1872 Stevenson, Wm., Lochgrog, Bishopbriggs
 1860 Stewart, Alexander, Perth
 1871 STEWART, Sir A. Douglas, of Grandtully, Bart., Perth
 1874 Stewart, Archibald, of Ensay, Obbe, Harris
 1840 Stewart, Charles, of Brin, Solicitor, Inverness
 1874 Stewart, Charles, Collielaw, Lauder
 1858 Stewart, Charles, Tighnduin, Killin
 1842 Stewart, David, London
 1869 Stewart, David W., of Grange, Lock-erbie
 1870 Stewart, Donald, Chapel Park, Kingussie
 1859 Stewart, Donald, Bruar, Blair Athole
 1870 Stewart, Duncan, Mosspebble, Ewes, Langholm
 1863 Stewart, Commander Duncan, R.N., New Club, Edinburgh
 1844 Stewart, G., Kirkechrist, Kirkcudbright
 1874 Stewart, George, Auctioneer, Dumfries
 1838 Stewart, H. B., of Balnakeilly, Pitlochry
 1857 Stewart, H. G. Murray, of Broughton, Cally, Gatehouse
 1871 Stewart, James, Blairfettie, Blair Athole
 1876 Stewart, James, Butcher, Coupar-Angus
 1851 Stewart, J., Pitskelly, St Martins, Perth

- Admitted
 1858 Stewart, James, Heathfield, Irvine
 1857 Stewart, James, Ballyargan, Ardrihaig
 1869 Stewart, James W., C.E., 13 Young Street, Edinburgh
 1873 Stewart, John, Bochastle, Callander
 1854 Stewart, John, Burnside, Strathaven
 1855 Stewart, John, Upper Ardrosedale, Rothsay
 1852 Stewart, John, Duntulm, Portree
 1871 Stewart, Captain John C., of Fasna- cloich, Appin, Fort-William
 1824 Stewart, J. Lorne, of Coll, Stronvar, Campbeltown
 1853 Stewart, John Archd. Shaw, 13 Queen's Gate, London
 1862 Stewart, Malcolm, Fife Keith, Keith
 1837 Stewart, M. S., of Southwick, Dum- fries
 1869 Stewart, Mark John, of Blairderry, M.P., Ardwell, Wigtownshire
 1848 STEWART, Sir M. R. Shaw, of Black- hall, Bart., Greenock
 1863 Stewart, Neil P., Vaynol, Bangor, North Wales
 1859 Stewart, Osmond de Haviland, Water- head, Lockerbie
 1860 Stewart, Peter, Dornoch Mains, Annan
 1858 Stewart, Robert, of Ingliston, Ratho
 1871 Stewart, Major Robert, of Ardvoirlich, Lochearnhead
 1873 Stewart, Robert, Kippenross, Dunblane
 1846 Stewart, Robert H. Johnstone, of Phys- gil, Glasserton, Whithorn
 1857 Stewart, Samuel, Sandhole, Fraser- burgh
 1876 Stewart, William, Auchlatt, Pitlochry
 1850 Stewart, William, Tonroech, Campbel- town
 1857 Stewart, William, 24 Maclean Street, Plantation, Glasgow
 1860 Stewart, William, Saddler, Aber- feldy
 1872 Stewart, William, Octofad, Port Char- lotte, Islay
 1868 STIRLING, Sir C. E. F., of Glorat, Bart., Milton of Campsie
 1864 Stirling, Captain Gilbert, Royal Horse Guards, London
 1857 Stirling, Major Graham, of Craigharnet, Lennoxton
 1867 Stirling, James, of Garden, Kippen, Stirling
 1833 Stirling, John, of Kippendavie, Dun- blane
 1865 Stirling, Lieut.-Colonel John S., of Gargunock, R.A., Woolwich
 1839 Stirling, T. Graham, of Strowan, Crieff
 1855 Stirling, William, of Torduff, Linlith- gow
 1876 Stirton, Andrew, Mill of Cluny, Blair- gowrie
 1867 Stobo, Andrew, Porterstown, Thornhill
- Admitted
 1860 Stobo, Robert, of Hallidayhill, Auld- girth, Dumfries
 1855 Stodart, David, Banker, Lanark
 1875 Stodart, George, Netherton, Newton Mearns, Renfrewshire
 1851 Stodart, John, Cawder Cult, Fern, Maryhill
 1871 Stodart, John, Shettleston, Glasgow
 1855 Stodart, William, Wintonhill, Tranent
 1861 STORMONT, Right Hon. Viscount, Scone Palace, Perth
 1869 Stordy, Robert, St Leonard's Hill, Edin- burgh
 1832 Stott, Gibson, 27 Victoria Street, Westminster, London
 1874 Strachan, Andrew, Saphock, Old Mel- drum
 1876 Strachan, George, Inverebrie Mains, Ellon
 1858 Strachan, James, Wester Fowlis, Alford
 1858 Strachan, Lewis, Cluny of Raemoir, Banchoy
 1857 Strang, J., High Crewburn, Strathaven
 1847+STRATHALLAN, Right Hon. Viscount
 1867+STRATHMORE, Right Hon. the Earl of, Glamis Castle, Glamis
 1874 Stratton, David, 13 Middleby Street, Edinburgh
 1829 Strong, Thomas, W.S., 2 Grosvenor Street, Edinburgh
 1863 Stuart, Alexander C., of Eaglescairn, Haddington
 1865 Stuart, Alexander, of Lathiers, Turriff
 1873 Stuart, Charles, Tomindugle, Knock- ando, Craigellachie
 1868 Stuart, Henry, Montford, Rothsay
 1849+SUTHERLAND, His Grace the Duke of, K.G., Stafford House, London
 1876 Sutherland, Alex., Rampyards, Watten, Golspie—*Free Life Member*
 1871 Sutherland, D. M., Burray, Kirkwall
 1853 Sutherland, Eric, Rosevalley, Elgin
 1849 Sutherland, George, of Forse, Lybster
 1871 Sutherland, George, The Peel, Tibber- muir, Perth
 1865 Sutherland, James B. (of Lanthead, Dunscore), S.S.C., 10 Windsor Street, Edinburgh
 1852 Sutherland, S., Springvale, Sheffield
 1865 Sutherland-Walker, E. C., of Skibo, Skibo Castle, Dornoch
 1839 SUTTIE, Sir George Grant, of Bal- gone, Bart., Balgone, Drem
 1858 Swan, James, Live Stock Agent, 37 Lauriston Place, Edinburgh
 1869 Swan, James, Inverpeffer, Carnoustie
 1865 Swan, P. D., Provost of Kirkcaldy
 1852 Swan, Robert, Writer, Kelso
 1863 Swan, Samuel, Bush, Jedburgh
 1858 Swan, Thomas, Live Stock Agent, 37 Lauriston Place, Edinburgh
 1871 Swan, William, Moat Mill, Dundee

- Admitted
- 1861 Swann, James, Collierhall, Douglas
 1859 Swann, J. R., Dunedin, Otago
 1865 Swanwick, R., Royal Agricultural College Farm, Cirencester
 1857 Swinburne, Capt., R.N., of Eilan Shona, Strontian
 1841 Swinton, Archibald Campbell, of Kimerghame, Dunse
 1862 Swinton, P. Burn, Holyn Bank, Gifford
 1853 Sydserff, Thomas Buchan, of Ruchlaw, Prestonkirk
 1874 Syme, David, Manager of The Lawson Seed and Nursery Co., Limited, 1 George IV. Bridge, Edinburgh
 1875 Syme, James, Millbank, Edinburgh
 1857 Syme, William, Craigie, Leuchars, Fife
 1868 Symington, G. C., Kirkearswell, Kirkcudbright
 1876 Symington, James, Auctioneer, Lanark
 1848 Symington, T. late Eastside, Penicuik
 1868 Symington, Gilbert, City of Glasgow Bank, Glenluce
- 1845 Tait, Alexander D., of Milrig, Kilmar-nock
 1874 Tait, George, Veterinary Surgeon, Elgin
 1875 Tait, George, jun., V.S., Elgin
 1846 Tait, James, Banker, Kelso
 1866 Tait, James Campbell, W.S., 13 Great Stuart Street, Edinburgh
 1872 Tait, James, Highridge Hall, Kelso
 1834 Tait, J., Advocate, 13 Great Stuart Street, Edinburgh
 1876 Tait, John, Crichtie, Inverurie
 1842 Tait, Joseph, of Haughland, Elgin
 1863 Tait, William, Vencheon, Kelso
 1862 Tait, William Reid, Mina Villa, Thurso
 1862 Tawse, John, W.S., 11 Royal Terrace, Edinburgh
 1859 Tawse, John Wardrope, W.S., 49 Queen Street, Edinburgh
 1858 Tayler, W. J., of Glenbarry, Rothiemay House, Huntly
 1877 Tayleur, Edward, of Dalskairth, Dumfries
 1863 Taylor, Alexander, Hillhouse, Lauder
 1869 Taylor, Andrew, care of W. A. Taylor, Writer, Cupar-Fife
 1858 Taylor, Geo., of Kirktonhill, Montrose
 1876 Taylor, Hugh, Kamishill, Hurlford, Kilmarnock
 1873 Taylor, James, Land Steward, Buchanan, Drymen
 1876 Taylor, James, Land Steward, Pitfour, Mintlaw
 1858 Taylor, John B., Seton West Mains, Prestonpans
 1861 Taylor, John, Redcastle, Arbroath
 1870 Taylor, Joseph, Potholm, Langholm
 1853 Taylor, M., Letter Farm, Cove, Greenock
 1857 Taylor, R., late Laggan, Campbeltown
- Admitted
- 1857 Taylor, Robert, Dumfrenny, Banchory
 1877 Taylor, Robt., Secretary, Stirlingshire Agricultural Society, Stirling
 1872 Taylor, Thos., Seed Merchant, Dalkeith
 1857 Templeton, Robert, Rannachan, Campbeltown
 1853 Tennant, C., of the Glen, Innerleithen
 1833 Tennant, John, St Rollox, Glasgow
 1863 Tennant, Robert (of Rosehall, Lairg), M.P., Scoureroft Lodge, Shadwell, Leeds
 1872 Tennant, T., of Priestgill, Strathaven
 1876 Tennant, Thomas, Walston, Penicuik
 1876 Tennant, William John, Gallin Cottage, Aberfeldy
 1873 Terris, James, jun., Dullomuir, Blair Adam
 1877 Thom, Alex., Chapelhill, Peebles
 1871 Thom, James, Leden Urquhart, Strath-miglo
 1858 Thom, James C., Quithelhead, Durris, Aberdeen
 1875 Thom, James, Wellsgreen, East Wemyss, Fifeshire
 1871 Thom, William, Demperston, Auchtermuchty
 1855 Thomas, James, Forthar, Kettle, Ladybank
 1861 Thomas, Robert, of Noranside, Forfar
 1872 Thomas, William, Pinnacle, Ancrum, Jedburgh
 1871 Thompson, Alex. Barnail, Port William
 1845 Thompson, Andrew, Berwick-on-Tweed
 1868 Thompson, Geo., of Pitmedden, Dyce, Aberdeen
 1867 Thompson, Henry, of High Green, Ramshope, Otterburn
 1872 Thompson, John, Bailieknowe, Kelso
 1874 Thoms, Geo. Hunter, yr. of Aberlemno, Advocate, Sheriff of Caithness, Orkney, and Shetland, 52 Great King Street, Edinburgh
 1861 Thoms, Patrick Hunter, of Aberlemno, Dundee
 1825 Thomson, Alexander, Banker, Greenock
 1867 Thomson, A., of Mainhill, St Boswells
 1873 Thomson, Alex., Mains, Tilliecultry
 1867 Thomson, Charles W., C.A., 16 Lennox Street, Edinburgh
 1869 Thomson, Duncan M., Coachbuilder, Stirling
 1836 Thomson, George, New Club, Edinburgh
 1854 Thomson, George, Anville, Canaan Lane, Edinburgh
 1863 Thomson, George, Hopton, Ancrum, Jedburgh
 1855 Thomson, James, Mungoswalls, Dunse
 1858 Thomson, James, Holmes, Broxburn
 1861 Thomson, J., Belmont, Dumfries
 1868 Thomson, Jas., Newseat of Dumbreck, Uduy

Admitted	Admitted
1874 Thomson, John, Avonhead, New Monkland	1869 Tinning, John, Chillesford Lodge, Sudbourne Hall, Wickham Market, Suffolk
1869 Thomson, John, Blaiket, Crocketford, Dumfries	1859 Tod, Alexander, Aitkendean, Lasswade
1877 Thomson, John, Carronflats, Grangemouth	1872 Tod, George, Bankhead, Cairneyhill, Dunfermline
1869 Thomson, John, 49 Hope Street, Glasgow	1870 Tod, James, Glenree, Lamlash
1875 Thomson, John, Prospect Bank, Cathcart	1877 Tod, James, jun., Easter Cash, Strathmiglo
1848 Thomson, John Anstruther, of Charle- ton, Colinsburgh	1869 Tod, James Carstairs, Gorgie Mains, Edinburgh
1867 Thomson, John Comrie, Sheriff-Substi- tute of Aberdeen and Kincardine	1870 Tod, John W., W.S., 66 Queen Street, Edinburgh
1874 Thomson, J. Grant, Wood Manager, Grantown, Strathspey	1864 Tod, Captain R. A. B., of Howden, Mid-Calder
1869 Thomson, J. S., M'Cheynston, Dum- fries	1870 Tod, Thomas M., West Brackly, Kin- ross
1870 Thomson, Lockhart, S.S.C., 114 George Street, Edinburgh	1851 Tod, William, Gospetry, Milnathort
1873 Thomson, Mitchell, 43 George Street, Edinburgh	1864 Tod, William, Glenree, Lamlash, Arran
1859 Thomson, Peter, Cowcoch, Abergele, North Wales	1876 Todd, David, 18 St Patrick Square, Edinburgh
1874 Thomson, Robert, Burnbank, Blair- Drummond	1876 Todd, Gavin J., Kinellar Lodge, Aber- deen
1857 Thomson, Robert, Seggie, Guard Bridge	1858 Todd, James, Gillespie, Glenluce
1864 Thomson, R. J., late Grange, Kilmar- nock	1865 Todd, James, Castle Mains, Dirleton, Drem
1875 Thomson, Thomas, Bankhead, Alloa	1869 Todd, Wm., Auchness, Ardwell
1850 Thomson, Thomas, Merchant, Glasgow	1865 Tolmie, Alex., Ballisparten, Ardersier
1844 Thomson, William, of Balgowan, Perth	1871 Torrance, Archibald P., Kippielaw, Dalkeith
1854 Thomson, W., 10 Stafford Street, Edin- burgh	1863 Torrance, George, Sisterpath, Dunse
1876 Thomson, William J. F., Gunmaker, Hanover Street, Edinburgh	1877 Torrance, Thomas A., Burnhouse Villa, Camps, Kirknewton
1873 Thomson, William, Nyaad, Stirling	1863 Torrance, T., Laws, Chirnside
1871 Thomson, William, Coachbuilder, Perth	1872 Torrance, William, Camps Lime Works, Mid-Calder
1875 Thomson, Wm., Aberdeen Town and County Bank, Tarland	1873 Torry, Adam Ogilvie, Burnside, Forfar — <i>Free life Member</i>
1872 Thomson, W. A., 7 Bonnington Place, Edinburgh	1877 Tough, James, Mains of Drum, Drum- oak, Aberdeen
1875 Thomson, William G., 49 Hope Street, Glasgow	1870 Towerson, John, Corkickle, Whitehaven
1869 Thomson, William Hill, Glasgow	1876 Traill, Thomas of Holland, Kirkwall
1841 Thomson, William Thomas, 3 George Street, Edinburgh	1846 Traquair, Ramsay H., Colinton, Slate- ford
1859 Thorburn, David, Calgary, Tobermory	1857 Trench, Henry, of Cangort Park, Ros- crea, Ireland
1877 Thorburn, Robert, Stonehill, Larack	1874 Trotter, Angus, Auctioneer, Fort- rose
1869 Thornton, James, Crofthead, Green- burn	1841 Trotter, Chas., of Woodhill, Blairgowrie
1872 Thornton, Thomas, Crofthead, Green- burn	1865 Trotter, Coutts, 11 Melville Street, Edinburgh
1824 Threshie, David Scott, W.S., Jersey	1865 Trotter, Lieut.-Colonel H., of Morton Hall, Edinburgh
1824 THRIEPLAND, Sir P. M., of Fingask, Bart., Errol	1829 Trotter, Robert Knox, of Ballindean
1872 Thyne, John, 21 Dalrube Street, Edin- burgh	1875 Trotter, Robert, Garguston, Beaulieu
1859 Thyne, William, Hoprig Mains, Tranent	1866 Trotter, T. C., 54 Park Street, Gros- venor Square, London, W.
1844 Timins, William, of Hillfield, Stanmore, Middlesex	1869 Trotter, Lieut.-Colonel H., of the Fush, Edinburgh
	1875 Troup, Alex., Strathmiglo
	1850 Tudhope, G., 62 Pollock Street, Glas- gow
	1873 Tulloch, James, Dalcs, Inverkeithing

- Admitted
 1875 Tulloch, John, Midmains, Duffus, Elgin
 1844 Turnbull, Alexander, Thornton, Coldstream
 1874 Turnbull, David, W.S., 12 Belgrave Crescent, Edinburgh
 1857 Turnbull, Gregor, Merchant, Glasgow
 1863 Turnbull, J., Lempitlaw, Eastfield, Kelso
 1877 Turnbull, James, St Colme House, Aberlour, Fife
 1844 Turnbull, John, of Abbey St Bathans, W.S., 49 George Square, Edinburgh
 1863 Turnbull, John, East Middle, Hawick
 1863 Turnbull, John, Palace, Jedburgh
 1862 Turnbull, Mark, Melrose Mills, Melrose
 1859 Turnbull, P., Little Pinkerton, Dunbar
 1877 Turnbull, Peter M., Smithston, Rhynie
 1850 Turnbull, S., Bonhill Place, Renton
 1863 Turnbull, William J., Graden, Kelso
 1872 Turnbull, William, Goukshill, Gorebridge
 1863 Turnbull, William George, Spittal, Jedburgh
 1875 Turner, Archd., jun., Drumdrishaig, Ardrishaig
 1853 Turner, Duncan, Corachaive, Sandbank
 1859 Turner, Frederick J., the Dean, Kilmarnock
 1853 Turner, John, of Turner Hall, Ellon
 1873 Turner, Peter, Mannerston, Linlithgow
 1855 Turner, Richard, Broompark, Mid-Caldor
 1876 Turner, Robert, Auchnarrow, Ballindalloch
 1863 Turner, W., Mains House, Linlithgow
 1868 Turner, William, M.B., Professor of Anatomy, University of Edinburgh, 6 Eton Terrace
 1877† Tweeddale, Most Noble the Marquis of, Yester House, Haddington
 1869 Tweeddale, George, Gilmerton, St Andrews
 1859 Tweedie, Alexander, Coats, Haddington
 1873 Tweedie, Alexander Gladstone, Glespin, Douglas, Lanarkshire
 1860 Tweedie, James, of Quarter, Raehan House, Biggar
 1875 Tweedie, James, Deuchrie, Prestonkirk
 1871 Tweedie, Richard, The Forest, Catterick
 1871 Tweedie, Thomas, Merchant, Annan
 1863 Tytler, James Stuart, of Woodhouselee, W.S., 36 Melville Street, Edinburgh
 1864 Tytler, Charles E.F., of Sanquhar, Forres
 1860 Tytler, Colonel Fraser, of Aldourie, Inverness
 1873 Udney, John Henry Fullarton, of Udney and Dudwick, Udney, Aberdeen
 1864 Umphray Andrew, of Reawick, Lerwick

- Admitted
 1864 Urquhart, B. C., of Meldrum, Old Meldrum
 1876 Urquhart, Lieut. F. Pollard, of Craigs-ton, Turriff
 1858 Urquhart, J. G., of Vellore, Linlithgow
 1875 Urquhart, John, Dundonnell, Ullapool
 1875 Ure, George, Wheatlands, Denny
 1875 Ure, George R., Hope Park, Bonny-bridge
 1873 Ure, John, Westwood, Drip, Stirling
 1874 Ure, William, Bogton, Larbert
 1864 Ure, William, Crawfordston, Kippen
 1853 Usher, John, Stodrig, Kelso
 1872 Usher, John, jun., Gatehousecote, Hawick
 1872 Usher, Thomas, jun., Courthill, Hawick
 1857 Vallance, Hugh, Greathill, Strathaven
 1876 Vallentine, George, Arnhall, Brechin
 1858 Vallentine, J., Nether Afflock, Dunecht
 1860 Vassal, Lieut.-Gen. R., London
 1864 Veitch, Chris., 5 Carlung Place, Edinr.
 1867 Veitch, Walter, Grange, Kinghorn
 1856 Vere, C. E. Hope, late Ledard, Aberfoyle
 1867 VERNON, Hon. Greville R., Auchans House, Kilmarnock
 1873 Villiers, Frederick Ernest, Closeburn Hall, Thornhill
 1874 Waddell, A. Peddie, 4 Great Stuart Street, Edinburgh
 1874 Waddell, James, Airdrie, New Monkland
 1872 Waddell, John, of Easter Inch, 10 St Andrew Square, Edinburgh
 1869 Waddell, John, Southrigg, Bathgate
 1869 Waddell, William, Nether-ton, Whitburn
 1857 Wakefield, J. Collen, late Eastwood Park, Thornliebank
 1857 Wakelin, John, Oil Mills, Musselburgh
 1873 Walker, Alexander, of Findynate, Bal-linluig
 1870 Walker, Alexander, Stagebank, Heriot
 1872 Walker, Alex. John (Bowland), 3 Manor Place, Edinburgh
 1847 Walker, Charles (late Drumblair), Australia
 1861 Walker, Fountaine, of Ness Castle, Inverness
 1857 Walker, Francis, Craignetherty, Turriff
 1863 Walker, Francis, late Camptown, Haddington
 1858 Walker, Lieut.-Col. George G., of Crawfordton, Thornhill
 1875 Walker, George A., Novar Mains, Evanton
 1863 Walker, G. J. (Walker & Beattie, Land Surveyors, Aberdeen), Portlethen, Aberdeen
 1861 Walker, Henry West, Banker, Auchtermuchty

Admitted

- 1860 Walker, James, of Dalry, 10 Grosvenor Crescent, Edinburgh
 1847 Walker, James, of Blairton
 1854 Walker, James, Kilpunt, Broxburn
 1867 Walker, Jas., Brough, Westray, Kirkwall
 1869 Walker, James, Dauphin House, St Andrews
 1877 Walker, James, West side of Brux, Kildrummy, Aberdeen
 1848 Walker, John, W.S., 31 Buckingham Terrace, Edinburgh
 1857 Walker, John, Eastfield, Springburn
 1862 Walker, John, 1 Polwarth Terrace, Edinburgh
 1865 Walker, John, of Ardpeaton, Craighrownie, Roseneath
 1872 Walker, J. P. S., Mountrich, Dingwall
 1853 Walker, Robert, Montbletton, Banff
 1854 Walker, Robert, Leuchars House, Elgin
 1859 Walker, Robert, Altyre, Forres
 1861 Walker, Robert, Muirhall, Perth
 1875 Walker, Robert B., Mains of Portlethen, Aberdeen
 1875 Walker, Thomas, Lochton, Inchture
 1861 Walker, Thomas R., Cupar-Fife
 1859 Walker, W., Bahymouth, St Andrews
 1858 Walker, Wm., Ardhunckart, Mossat
 1864 Walker, William, Kintrae, Elgin
 1872 Walker, William, Horse Dealer, Stirling
 1835 Walker, William S., of Bowland, C.B., 125 George Street, Edinburgh
 1868 Walker, William Campbell, yr. of Bowland
 1873 Wall, George Y., Durham—*Free Life Member*
 1865 Wallace, David, Lochwood, Coatbridge
 1861 Wallace, James, Brake, Denino, Fife
 1861 Wallace, John, late Illieston, Broxburn
 1875 Wallace, John, 30 Oak Street, Glasgow
 1875 Wallace, Robert, Auchenbrain, Mauchline
 1854 Wallace, Robert A., Rhynd, Dunfermline
 1870 Wallace, R., Langbarns, Kirkeudbright
 1844 Wallace, Wm., of Auchinvole, Kilsyth
 1875 Wallace, William, Kinneir, Kilmany, Cupar-Fife
 1871 Wallace, William, of Newton of Collessie, Ladybank
 1854 Wallbank, Jonas, Berwick-upon-Tweed
 1872 Walley, Thos., M.R.C.V.S., Principal of the Veterinary College, Edin., Professor of Cattle Pathology to the Society
 1873 Walls, Robt., Kerse Mills, Stirling
 1845 WALPOLE, The Hon. Henry, Wolterton Park, Aylsham, Norfolk
 1873 Walton, George Kent, Long Campton, Shipston-on-Stour, Warwickshire—*Free Life Member.*

Admitted

- 1869 Wardrop, W. M., of Bridgehouse
 1874 Wardrope, Robert, Garlaff, Cumnock
 1852 Warnock, A., Bearyards, Bishopbriggs
 1862 Warrack, William, Newmill of Fintray, Aberdeen
 1868 Warrant, Capt. A. J. C., Ryefield, Ferrintosh, Dingwall
 1858 WARRENDER, Sir G., of Lochend, Bart., Bruntsfield House, Edinburgh
 1856 Warwick, W., Glencartholm, Canonbie
 1871 Waters, George S., Tister Mains, Halkirkroad
 1837 Waterston, Charles, Banker, Inverness
 1869 Watherston, James, 29 Queensferry Street, Edinburgh
 1869 Watherston, Wm., 29 Queensferry Street, Edinburgh
 1875 Watson, Arthur, Easter Busby Farm, Busby, Glasgow
 1855 Watson, Crawford, The Lone, Tenbury, Worcestershire
 1859 Watson, Douglas (late Thurster, Wick), New Zealand
 1876 Watson, George, Edendiack, Gartly
 1848 Watson, George, of Norton, Ratho
 1870 Watson, Geo., Fushiebrae, Gorebridge
 1841 Watson, Henry George, C.A., 123 George Street, Edinburgh
 1875 Watson, Hugh, Cuil, Cairndow
 1870 Watson, Jas. M., 11 Lauriston Park, Edinburgh
 1869 Watson, John Paton, of Blackford, Rothie-Norman
 1857 Watson, John, of Earnock, Hamilton
 1864 Watson, John, Culterallers, Biggar
 1872 Watson, Patrick, Friarstown House, Tallaught, County Dublin
 1852 Watson Wm., late The Binns, Dundee
 1841 Watson, William, Seaside, Errol
 1863 Watson, W. S., of Burnhead, Bucklands, Hawick
 1873 Watt, Alex., Burnshot, Linlithgow
 1871 Watt, George, Kilmany, Cupar-Fife
 1868 Watt, Gordon, Hirn, Banchoy-Ternan
 1856 Watt, James, Biggar
 1864 Watt, James, Balbarton, Kirkealdy
 1875 Watt, James, Garbity, Orton, Fochabers
 1875 Watt, Robert, solicitor, Airdrie
 1858 Watt, Wm. W. G., of Breckness, Kierfield, Stromness
 1872 Wauchope, Capt., of Niddrie Marischall, Liberton
 1842 WAUCHOPE, Sir John Don., of Edmonstone, Bart., Edmonstone House, Liberton
 1871 Waugh, Allan, Avonbridge, Falkirk
 1857 Waugh, J., of St John's Kirk, Biggar
 1875 Waugh, John, jun., Glenormiston, Innerleithen

Admitted	Admitted
1873 Waugh, John, Langshaw, Galashiels	1870 Whyte, Archd., jun., Cotton of Craigs, Alyth
1873 Waugh, William, V.S., Stirling	1876 Whyte, Duncan, 326 Duke Street, Glasgow
1853 Webster, James, S.S.C., 8 Gloucester Place, Edinburgh	1876 Whyte, D. C., Ballimore, Lochstriven head, Sandbank
1863 Webster, J., New Horndean, Berwick	1865 Whyte, James, Little Clinterty, Blackburn, Aberdeen
1870 Webster, Robt., Airds of Kells, New Galloway Station	1870 Whyte, James A., Kirkmabreck, Stranraer
1856 Webster, R., Lorne Place, Leith Walk	1853 Whyte, John, Ballochyle, Sandbank
1863 Weddell, John Wilkie, Lauder Barns, Lauder	1871 Whyte, John, West Denoon, Meigle
1874 Wedderburn, Henry Scrymgeour, of Wedderburn, Birkhill, Cupar-Fife	1875 Whyte, John, Lundin Mill, Largo
1870 Weir, Alex., Newhousemill, East Kilbride	1860 Whyte, Rev. R., Dryfesdale, Lockerbie
1875 Weir, John, Grain Merchant, Coatbridge	1868 Whyte, William, Spott, Kirriemuir
1864 Weir, Robert, Brownhill, Carnwath	1870 Wight, Alex., Ironmonger, Forres
1873 Weir, William, Inehes, Falkirk	1865 Wight, Geo., 14 Duke Steeet, Edinburgh
1868 Weir, William, Portland Iron Works, Kilmarnock.	1872 Wight, R. B., Eccelaw, Cockburnspath
1850 Welsh, Alexander, Edinburgh	1827 Wightman, James Seton, of Courance, 7 Darnaway Street, Edinburgh
1869 Welsh, Henry, 6 George Street, Edin.	1873 Wightman, James C. Seton, Courance, 7 Darnaway Street, Edinburgh
1860 Welsh, John, Kirkton, Hawick	1869 Wightman, John Seton, yr. of Courance, 7 Darnaway Street, Edinburgh
1853 Welsh, Thomas, of Earlsbaugh, Ericstane, Moffat	1873 Wilken, George, Waterside of Forbes, Alford
1842 Welwood, Alan A. Maconochie, of Garvoch, Meadowbank, Kirknewton,	1860 Wilkie, Andrew, Banker, Leven
1819† WEMYSS and MARCH, Right Hon. The Earl of, Gosford, Haddington	1843 Wilkie, D., of Auchlishie, Kirriemuir
1846 Wemyss, D. Sinclair, of Southdun, Wick	1857 Wilkie, George, Cowdenlaws, Dysart
1872 Wemyss, R. G. E., of Wemyss, Kirkcaldy	1830 Wilkie, John, of Foulden, Berwick
1863 WHARNCIFFE, Right Hon. Lord, 15 Curzon Street, London	1862 Wilkin, T., Tinwald Downs, Dumfries
1863 White, A., Causeway Bank, Chirnside	1873 Will, Robert W., S.S.C., 27 Albany Street, Edinburgh
1861 White, Francis, M.D., Perth	1872 Willacy, Robert, Penwortham Priory, Preston
1863 White, James, of Overton, Glasgow	1867 Williams, W., Principal of the Veterinary College, Edinburgh, Professor of Veterinary Surgery to the Society
1876 White, James, Stagehall, Stow	1858 Williamson, Andrew F., Standingstones, Dyce, Aberdeen
1842 White, John, of Drumelzier, Netherurd House, Dolphinton	1870 Williamson, Benjamin, Canal Iron Works, Kendal
1863 White, John, of Grougar, 53 Princes' gate, London	1861 Williamson, David Robertson, of Lawers, Crieff
1873 Whyte, John, Ardeneapple, Helensburgh	1871 Williamson, Douglas G., Bombie, Kirkcudbright
1872 White, John A., Shiells Mains, Biggar	1850 Williamson, George, Shempston, Elgin
1868 White, J. F., Grain Merchant, Aberdeen	1853 Williamson, Jas., Beechhill, Aberdeen
1838 White, Peter, Accountant, Glasgow	1829 Williamson, John W., Sheriff-Clerk, Kinross
1842 White, Robert, W.S., 23 Drummond Place, Edinburgh	1875 Williamson, Robert, Netherwood, Banff
1876 White, Robert, 3 Abereromby Place, Edinburgh	1871 Williamson, Thos., Merchant, Kirkcudbright
1872 White, Robt., Outerston, Gorebridge	1854 Willis, Thomas, Manor House, Carperby, Bedale
1838 White, William, Merchant, Glasgow	1868 Willison, Duncan Campbell, Dalpeddar, Sanquhar
1854 White, Wm., Mousbank, Lanark	1873 Willison, Geo., Parish Holm, Douglas
1872 White, Wm., Lennel Hill, Coldstream	1857 Willison, Jas. P., of Cultzeum, Maxwellton, Maybole
1859 Whitelaw, Alex., M.P., of Gartshore, Gartsherrie House, Coatbridge	
1850 Whittet, Geo., Easter Drylaw, Davidson's Mains	
1861 Whitton, Andrew, of Couston, Newtyle	
1871 Whyte, Angus, Easdale, Oban	

Admitted

- 1858 Willison, John, Parish Holm, Douglas
 1868 Willison, J., jun., Glespinside, Douglas
 1861 Wilson, Adam, Midshiels, Hawick
 1842 Wilson, Alex., Inchgower, Buckie
 1854 Wilson, Alex., Kirkhill, Oldmeldrum
 1857 Wilson, Alex., Crosshill, Campbeltown
 1864 Wilson, Alex., Alford House, Dunblane
 1864 Wilson, Alexander, of Skeoch, Bannockburn
 1876 Wilson, Alex., Blacksmith, Stonehaven
 1864 Wilson, Edward L., Manufacturer, Bannockburn
 1859 Wilson, George, Harelaw, Chirnside
 1863 Wilson, George, Manufacturer, Hawick
 1865 Wilson, G., Roseland Cottage, Linlithgow
 1872 Wilson, George, Greenhill, Selkirk
 1876 Wilson, George, Whiteside, Tullynessle, Aberdeen
 1859 Wilson, J., Woodhorn Manor, Morpeth — *Free Life Member 1873*
 1871 Wilson, James, Boghall, Bishopton
 1867 Wilson, James, Erskine, Glasgow
 1844 Wilson, James, Glasgow
 1848 Wilson, Jas., Wester Cowden, Dalkeith
 1854 Wilson, James, Burnetland, Biggar
 1857 Wilson, Jas., Old Mill, New Cumnock
 1858 Wilson, James, Banker, Kilmarnock
 1857 Wilson, James, jun., Saddell Street, Campbeltown
 1860 Wilson, James, Bemersyde West, St Boswells
 1866 Wilson, Jas., 146 George Street, Edinburgh
 1877 Wilson, James, Mains of Scotstown, Bridge of Don, Aberdeen
 1870 Wilson, Jas. R., Banker, Sanquhar
 1874 Wilson, John, Cairnton of Boyndie, Portsoy
 1841 Wilson, John, of Cumledge, Dunse
 1851 Wilson, J., Edington Mains, Chirnside
 1855 Wilson, John, Professor of Agriculture, University of Edinburgh
 1865 Wilson, John, Castle Park, Huntly
 1875 Wilson, John, Lecropt, Bridge of Allan
 1876 Wilson, John, of Finnich Malise, 11 Woodside Place, Glasgow
 1857 Wilson, John, Overhouse, Strathaven
 1859 Wilson, John, of Auchineck, Killearn
 1859 Wilson, J. F., Darnhall Mains, Eddlestone
 1862 Wilson, J., Chapelhill, Cockburnspath
 1863 Wilson, J., of Hill Park, Bannockburn
 1863 Wilson, J. P., of Polquhairn, Sheriff of Ross, Cromarty, and Sutherland, 6 Dundas Street, Edinburgh
 1865 Wilson, Peter, Linsaig, Tigh-na-bruaich
 1870 Wilson, Peter, Noblehall, Lamancha
 1857 Wilson, Philip, Corn Factor, Dunse
 1858 Wilson, Richard, C.A., 28 Great King Street, Edinburgh
 1852 Wilson, Robert, Durn, Perth

Admitted

- 1870 Wilson, R., Linseed Crusher, Dundee
 1863 Wilson, Robert, Forehouse, Kilbarchan
 1868 Wilson, Robert, Lethenty, Alford, Aberdeenshire
 1857 Wilson, Thomas, late Auchincorrie, Campbeltown
 1876 Wilson, Thomas, Newton Ardonald, Cairnie, Huntly
 1877 Wilson, William of Banknook, Denny
 1849 Wilson, William, W.S., 16 St Andrew Square, Edinburgh
 1873 Wilson, William, (Picksley, Sims, and Co.), Leigh, Lancashire
 1858 Wilson, William, Hill House, Hoddesdon, Herts.
 1871 Wilson, William, Wolfstar, Tranent
 1871 Wilson, C. H. H., of Dalnair, Endrick Bank, Drymen
 1873 Wilson, Thomas, Solicitor, Aberdeen
 1867 Wingate, Wm., Nether Croy, Kilsyth
 1855 Wishart, Edward, 3 Laverockbank Terrace, Leith
 1868 Wishart, W., Cairntradlyn, Blackburn, Aberdeen
 1860 Woddrop, William Allan, of Dalmarnock, Dolphintoun
 1874 Wood, Christopher, Kintochat House, Brechin
 1873 Wood, Collingwood Lindsay, Freeland, Bridge of Earn
 1858 Wood, J., Midtown, King Edward, Banff
 1864 Wood, J., Whiteside, Greenlaw, Dunse
 1875 Wood, James, Riddrie, Parkhead
 1873 Wood, Walter A., 36 Worship Street, London, E.C. ;
 1828 Wood, William, 6 James Place, Leith
 1876 Wordsworth, R. W., Gartmore, Stirling
 1858 Wotherspoon, Arch. (late Spotsmains, Kelso), United States
 1877 Wragg, Charles, Grain Merchant, 4 Stockwell Street, Glasgow
 1857 Wright, Bryce, Dowhill, Girvan
 1850 Wright, David, Beal, Northumberland
 1876 Wright, Frank, 125 St Anne Street, Liverpool
 1839 Wright, James, Glasgow
 1853 Wright, Jas., 2 Lennox Street, Edinburgh
 1857 Wylie, George, Woodville, Canaan Lane, Edinburgh
 1870 Wylie, Alex., Bolton, Haddington
 1875 Wylie, Alex., W.S., 13 Picardy Place, Edinburgh
 1870 Wylie, And., Bellburn Cottage, Hunter's Quay, Greenock
 1863 Wylie, James, Inveraray
 1874 Wylie, James, Innerwick, Dunbar
 1849 Wylie, J., late Newfarm, Mid-Calder
 1855 Wylie, W. A., 14 West End Park St., Glasgow

Admitted
 1874 Wyllie, William, Fenwick, Ayrshire
 1868 Yeats, Alexander, Advocate, 89 Union Street, Aberdeen
 1838 Yeats, William, of Aquharney, 1 Union Place, Aberdeen
 1864 Yool, Thomas, Coulard Bank, Lossiemouth
 1864 Yorstoun, Captain M. C., of Tinwald, Irvine House, Langholm
 1852 Young, Alexander, Keir Mains, Dunblane
 1867 Young, Andrew, 21 Park Crescent, Stirling
 1859 Young, Andrew, Lochtyside, Thornton, Kirkcaldy
 1854 YOUNG, Hon. Lord, 28 Moray Place, Edinburgh
 1873 Young, George, Auctioneer, Dollar
 1842 Young, Harry, of Cleish Castle, Kinross
 1876 Young, Hugh, Killoch, Neilston
 1856 Young, James, Broadholm, Duntocher
 1860 Young, J. A., Orchardtown, Garliestown
 1863 Young, James, of Kelly, Wemyss Bay
 1876 Young, James, yr. of Kelly, Wemyss Bay
 1871 Young, James, Waterton, Elgin
 1875 Young, James, Cadboll, Fearn
 1868 Young, John, jun. (J. & T. Young), Ayr

Admitted
 1857 Young, John, Fulwood, Paisley
 1876 Young, John, Hailes Cottage, Slateford
 1857 Young, John, Netherwood Bank House, Dumfries
 1863 Young, Matthew, Oilcake Mills, Berwick-on-Tweed
 1869 Young, Robert, Greenlees, Cambuslang
 1870 Young, Major Thos., Lincluden House, Dumfries
 1872 Young, Thos., Oatridge, Linlithgow
 1876 Young, William Stirling, Keir Mains, Dunblane
 1873 Young, William, Taylorton, Stirling
 1873 Young, Wm., Waterbank, Carmunnock
 1870 Younger, Henry J., Abbey Brewery, Edinburgh
 1875 Younger, J. B. B. C., Bankhead, Leven. Fife
 1863 Younger, Robert, St Anns, Edinburgh
 1863 Younger, Wm., Haggerston Castle, Beal
 1870 Yuill, Archibald, 33 Cathedral Street, Glasgow
 1838 Yuille, And. B., of Darleith, Cardross
 1869 Yule, Edward, Prestongrange, Prestonpans
 1852 Yule, T. B., 36 Constitution St., Leith
 1868 Yull, John S., Little Ardo, Methlic
 1877 ZETLAND, Right Hon. the Earl of, Aske, Richmond, Yorkshire

TOTAL NUMBER OF MEMBERS, 4595.

HONORARY MEMBERS.

HONORARY ASSOCIATES.

Admitted
 1874 Dahl, Ferdinand August, Aas, Christiania

Admitted
 1874 Holst, Christian, Norwegian Court Paymaster

DIPLOMA FREE LIFE MEMBERS.

1876 Anderson, R. Lang, Milliken Park, Renfrewshire
 1873 Ashdown, A. H., M.R.A.C., Uppington, Salop
 1875 Beck, Thos. Coker, Foleshill, Coventry
 1873 Brown, William, Fuctor, Earlsmill, Forres
 1873 Browne, Colville, M.R.A.C., Long Melford, Suffolk

1873 Brydon, R., The Dene, Seaham Harbour
 1874 Burn, Forbes, Hardacres, Coldstream
 1873 Campbell, George, Kilken, Magency, Co. Kildare
 1873 Eley, Wm. Henry, Islingham, Frindsbury, Rochester, Kent
 1873 Elliot, Thomas John, M.R.A.C., Langley Park, Norwich
 1874 Erskine, Henry, Dalladies, Brechin

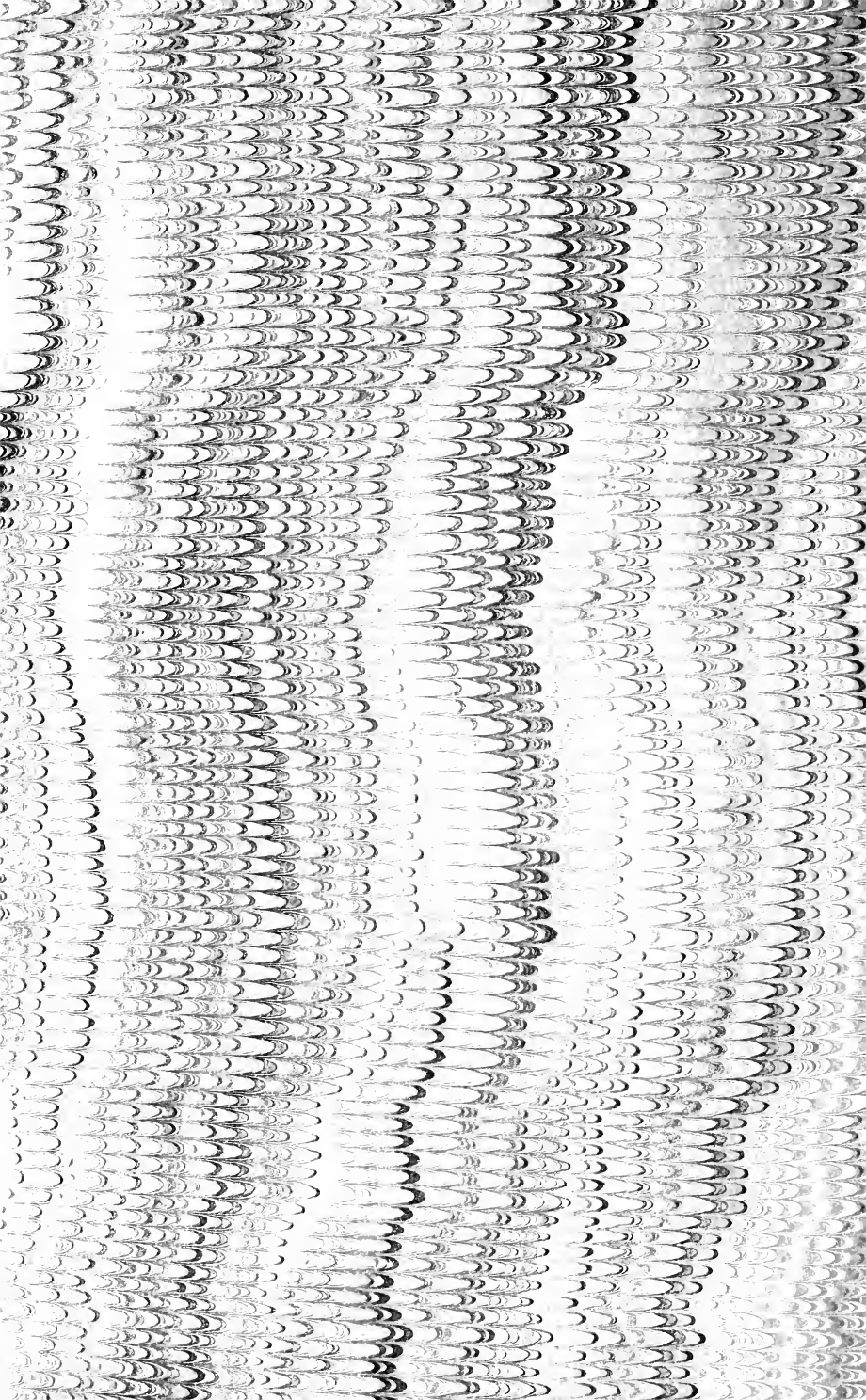
Admitted	Admitted
1876 Ferguson, Archd. A., Gosfield, Essex	1875 Murdoch, George Burn, M.R.A.C., Greenhill Lodge, Edinburgh
1873 Gerrard, John, Veterinary Infirmary, Market Deeping	1875 Murray, Robert W. E., Wester House Byers, Galashiels
1873 Giglioli, Italo, M.R.A.C., Florence	1873 Norman, Wm., M.R.A.C., Hall Bank, Aspatria
1873 Goddard, H. R., M.R.A.C., Belsay, Newcastle-on-Tyne	1873 Rome, Thomas, M.R.A.C., Northam- ton Downs, Barcoo River, Queensland
1874 Henderson, Richard, Coldstream	1873 Smith, William B., M.R.A.C., Stone- leigh Villa, Leamington
1873 Hill, Arthur James, M.R.A.C., Ac- countant, Moorgate Street, London	1876 Sutherland, Alex., Rampyards, Watten, Golspie
1873 Juckes, R. F., M.R.A.C., Cotwall, Wellington, Salop	1873 Torry, Adam Ogilvie, Burnside, For- far
1875 Kennedy, William, M.R.A.C., 89 Marine Parade, Brighton	1873 Wall, G. Y., M.R.A.C., Durham
1876 Maconchy, John Arthur, Rathmore, Aughnacliffe, Co. Longford	1873 Walton, George Kent, Long Campton, Shipston-on-Stour, Warwickshire
1873 Milne, John, Mains of Laithers, Tur- riff	1873 Wilson, Jacob, M.R.A.C., Woodhorn Manor, Morpeth
1873 Munby, Edward Charles, M.R.A.C., Myton Grange, Helperby, Yorkshire	

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