

The interstitial or cementing substances in the Elgin sandstones.

Contributors

Mackie, William.
Keith, Arthur, Sir, 1866-1955
Royal College of Surgeons of England

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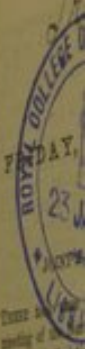
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Dr. Page



There was a meeting of the Executive Committee of the Society for the Study of the History of the United States and the History of the World, which was a good attendance. The meeting was presided over by Dr. Crane. The visitors were Mr. and Mrs. Crane, who spent the evening at the home of the hostess, Mrs. Crane. The meeting was held in the library of the Society, which is a fine building, with paper walls, after Dr. Crane had read a paper on the history of the United States. The Secretary, Mr. John Yost, M.A., of the University of Chicago, was also present, and Mr. Henry Perry.

OLD HISTORY

The following paper was read: "The History of the United States, A.D. 1492-1776", by Dr. Crane, LL.D., Columbia University. (The paper was read in the library of the Society, which is a fine building, with paper walls, after Dr. Crane had read a paper on the history of the United States. The Secretary, Mr. John Yost, M.A., of the University of Chicago, was also present, and Mr. Henry Perry.)

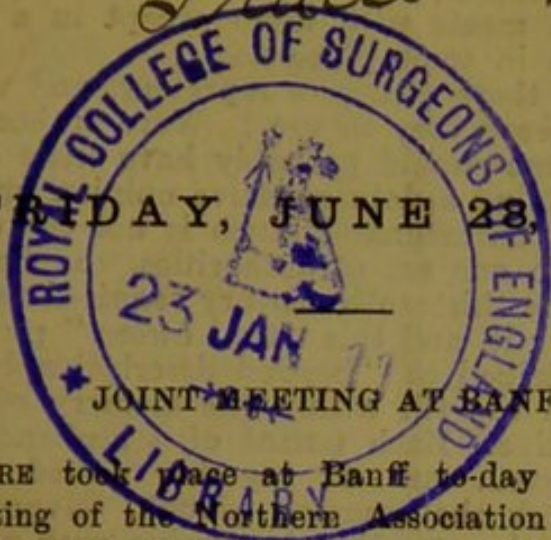
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Tracts 1598.

IX

FRIDAY, JUNE 23, 1901.



JOINT MEETING AT BANFF.

THERE took place at Banff to-day the annual meeting of the Northern Association of Literary and Scientific Societies, followed on Saturday by an excursion to the Enzie and Gordon Castle. There was a good attendance of ladies and gentlemen from various societies in the North, and the chair was occupied by Dr Cramond, Cullen.

The visitors were welcomed in the Museum, and half-an-hour was pleasantly spent there. Afterwards, the company went to a room in the Academy buildings, when papers on scientific subjects were read, after Dr Cramond had congratulated the representatives of the societies on again meeting at Banff. The Secretary of the Banffshire Field Club, Mr John Yeats, M.A., intimated receipt of letters of apology for absence from Rev. Mr Sutherland, Portsoy, and Mr Horne, of His Majesty's Geological Survey.

OLD SCOTTISH LAND MEASURES.

The following paper on Old Scottish Land Measures was read by Mr William Cramond, A.M., LL.D., Cullen:—

One cannot go far into old Scottish records without encountering bovates, oxgangs, carucates, and such like. Most of these terms were familiar to our ancestors a century or two ago, but they have a strangely unfamiliar look to the

present generation, and even in the country one now seldom meets with them except in a corrupted form in some place name.

What did these measures represent, and when and where were they in use? Were authorities in accord, one should probably have little difficulty in forming a determinative opinion on the matter; but unfortunately such is not the case. According to one set of authorities, the Scotch plough of the thirteenth century required twelve oxen to work it, and this "twal owsen" plough, though described as "beyond description bad," remained in use till within the memory of old men still alive. Each tenant of a husbandland kept two oxen, and six together united their oxen to work the common plough. Hence we have a plough-gate, that is, twelve oxen-gangs. This is the view of Mr J. H. Burton, who explains that the Scottish plough of the thirteenth century being ponderous required twelve oxen to draw it. There can be no doubt that the ten or twelve oxen plough was in almost universal use in Aberdeenshire in 1770. Improvements in the plough caused the "twal" oxen plough to disappear; but it could still be seen in certain districts of Aberdeenshire in the year 1792, and it did not finally disappear till 1815 or 1816. It is interesting to listen to old men still alive regarding the troubles that had been told them by men who as ploughmen had actually had to put their shoulder to the ill-going "twal-owsen" plough to help it on its way.

The views of Mr E. W. Robertson correspond more with ancient evidence than even those of Mr J. Hill Burton. According to Mr Robertson, eight oxen went to the plough, and he further explains that from time immemorial the "man with a yoke of oxen" seems to have been the lowest member of the rent-paying class of agriculturists, all below being paid in labour. Four such tenants found a full team for a plough, each occupying a virgate or quarter plough land. It is convenient here to supplement this information by stating that caruca meant a plough, and that a carucate was a plough land. One acre in the North represented an acre and a-half in the South. After 1066, the North acre prevailed over all. The evidence is mostly in favour of

eight oxgang forming one ploughgate, the divisions of the table going by 4, 8, &c., not by 12, &c. According to Mr Cosmo Innes, an oxgate was thirteen acres. The husbandman who kept two oxen for the common plough and possessed two oxgates had thus 26 acres, which was called a husbandland. Four of these joined in working the common plough, and their whole possession was a ploughgate, that is, the extent of land tilled by eight oxen, or 104 acres. By statute of James I. of Scotland, every man "tillan with a pleuch of aucht oxen" had to sow a certain quantity of pease and beans yearly. Lord Forbes' Rental (1532) shows the lands divided into ploughs, each of eight oxen, the ploughgate being sometimes let to four tenants, each of whom contributed the work of two pair of oxen to the common plough. These joint tenants were bound to keep good neighbourhood, and disputes arising were settled by a birley man mutually chosen. The system of four husbandmen contributing to the common plough was in operation in the Garioch up to 1720.

The table usually adopted stands as follows:—

13	acres	=	1	oxgang			
26	"	=	2	"	=	1	husbandland
52	"	=	4	"	=	1	auchtenpart
104	"	=	8	"	=	4	husbandlands = 1 ploughgate or carucate
416	"	=	32	"	=	16	" = 4 ploughgates = 1 davoch

OXGANG.—A bovate, or oxgang, or oxgate (bos, bovis, an ox), was as much as a team of oxen could plough. It varied from ten to twenty acres, according to the nature of the soil, &c. The word bovate was more frequently used than oxgate. An oxgang, according to some, represented a carucate or hide, and contained at least 120 acres. Some give 160 to 180 acres as a carucate (Thorold Rogers). The Court of Exchequer, in 1585, fixed an oxgate at 13 acres, and four oxgate as "ane pund land of auld extent." Ducange, Spelman, and Tytler (History of Scotland) give a bovate or oxgang as equivalent to 18 acres, a carucate equal to 8 bovates, and 8 carucates as a knight's fee; but this cannot be held as applying to Scotland. Wyntoun, who

wrote his "Chronykill" about the close of the fourteenth century, in referring to King Alexander III., who died A.D. 1285, says of the origin of the oxgang:—

Yhwmen, powere karl or knaive ..
 That wes off mycht an ox till hawe ..
 He gert that man hawe part in pluche
 Swa wes corne in [his] land enwche ;
 Swa than begowth and efftyr lang
 Off land wes mesure, ane oxgang.

But the measure was in use even before that time ; for "bovata terrae" occurs in writs of the twelfth century. The Latin jugerum was originally, like oxgate, not a definite measure, and not inappropriately the one was sometimes used as a translation of the other. Thus "prefatis duobus jugeribus lie two oxgates terrarum de Burntoun" (Cullen Register of Sasines, 1692). The writer of the Old Statistical Account of Rhynie and Essie (1797) says that some of the oxengate in the parish "are not 6 acres, others above 19 acres. The hills are less cultivated, and the low grounds formerly in wood are now more in culture." In the Merse, says Mr Cosmo Innes, an oxgate or bovate is 13 acres. Cassell's Encyclopædic Dictionary gives an oxgang as 20 acres. A bovate in Yorkshire was sometimes 16, 17, or 18 acres ; and we find "a bovate of land in the fields of Doncaster containing only 8 acres." According to Sir John Skene, "Alwaies ane oxengate of land suld conteine threttene acker." Isaac Taylor states that the number of acres in an oxgang was from 6½ to 30, according to the system of tillage and the way of reckoning. Twenty acres is exceptional, and can only occur in a two-field shift, where the oxgang is reckoned in both fields by the small hundred. Hyde Clark gives a bovate as from 6 to 40 acres. Coles, in his Dictionary of Hard Words (1732) gives an oxgate as "commonly taken for 15 acres." Mr T. J. Ewing, Warwick, says that an oxgang was not a measure of land, for example, like our acre, but what could be cultivated by one ox in a year ; therefore, according to soil, it varied from 8 or 10 acres to 35 or 40 acres. It was thus analagous to jugum or jugerum which was

eventually a precise extent of land, but at first "quod juncti boves uno die exarare possint" (Varro). So carucate (caruca, a plough), varied similarly, being eight oxgangs. The eight oxen of the ploughland made up the team, each small proprietor providing an ox. Fifteen to twenty acres was the average of the oxgang, and 120 acres the average of a carucate. A few examples may be quoted, out of many that could be given, to show the continuous use of the word *bovat* or *oxgang* in the North of Scotland for the last four centuries:—

- 1531.—"A *bovat* of the land of Hairlaw, in the Garioch."
- 1544.—"Ardbrangan extends to 8 *bovats*, in the thanage of Boyne" (Cullen Prothogall Buik).
- 1583.—"The 24 *oxgates* of Nethertown, in Grange parish."
- 1587.—"The four *oxingang* land of Blairmad."
- 1623.—"Four *oxgate* lands of Knockbog."
- 1630.—"Oxgate of Newmiln" (Keith).
- 1670.—"The lands of Wester Buckie, extending to 8 *oxgate*."
- 1671.—"The lands of Little Skeith, extending to 4 *oxgate*" (Deskford).
- 1691.—"The four *oxgaite* of the sun plough of Ternemny."
- 1714.—"The four *oxgate* lands of Auchincrivee."
- 1720.—"Eight *oxgate* of Upper Dallachy and 12 *oxgate* of Nether Dallachy."
- 1752.—Millegin is reckoned 8 *oxgate* (Grange). One *oxgate* of Parrack (Strathisla) pays of rent £17 9s. 4d. Sc., with 10s. for vicarage and half a merk for multure, also schoolmaster's salary. Seggiecrook is reckoned 2½ *oxgate*.
- 1775.—At the Court of the Regality of Spynie a disposition was produced of 8 *oxengate* lands of Milton of Balveny and Waulkmill thereof.
- 1787.—"The *davach* of Grange contains 42 *oxgates* or so."
- 1901.—"The *owsgang* at the Rottenhillock Park," near Barnyards of Cullen House is still so spoken of at the present day.

HUSBANDLAND.—A husbandland was two *oxgangs*, or 26 acres Scots, at least in the Merse

and Teviotdale. It was the fourth part of a ploughland or quarter-holding. The husbandus or cultivator, says Mr Cosmo Innes, had 26 acres, a husbandland. Jamieson defines a husbandland as a division of land commonly containing 26 acres of sok and syith land, i.e., such land as may be tilled by a plough or mowed by a sythe. Skene says: "I finde na certaine rule prescribed anent the quantity or valour of ane husbandland."

PLOUGHGATE.—A team of eight oxen was supposed to be required for a ploughgate, ploughland, or carucate. This was sub-divided into eight oxgangs or bovates. Jamieson (Dictionary) defines a ploughgate or ploughgang as being as much land as can be properly tilled by one plough, and adds that "in Fife a ploughgate is now understood to include about 40 Scots acres at an average." Another definition given of a ploughgate is that it is not of definite extent, but varies from 26 acres "where scythe and plough may gang," according to ancient estimate in the Merse, and even a less extent in other districts, up to 700 acres, and in certain cases much more in Lanarkshire. As to its indefiniteness, the following passage may be quoted from the twelfth chapter of the "Heart of Midlothian": "The defences proponed, say, that 'non constat' at this present what is a ploughgate of land, whilk uncertainty is sufficient to elide the conclusions of the libel." In the Preface to the Domesday Book, a carucate is defined as being as much arable land as could be managed with one plough and the beasts belonging thereto in a year, with pasture, houses, &c., for the persons and cattle. According to Sheriff Guthrie Smith ("Strathblane"), a carucate or ploughgate is said by most authorities to be equal to 104 acres, but some say 160 acres. He adds, however, the observation that, while a carucate was 104 or 160 acres arable land, it represented a varying quantity of grazing land, lochs, woodlands, &c. Fleta says the carucate or ploughland was equivalent to 180 acres, if the land lay in three arable common fields, namely, 60 for fallow, 60 for winter corn, and 60 for spring corn. If the land lay in two fields, it

amounted to 160 acres, namely, 80 for fallow and 80 for tillage.

The ploughgate was sub-divided into two, and the parts called auchten parts, each being one-eighth of a davoch, or four oxgates. Thus an auchten part was 52 acres. In some davochs there were ten or twelve auchten parts. In Elgin and other districts, where the word auchten, or aughten, or auchtand, was once in common use, mistakes are frequently made by supposing that the word meant auchteen (eighteen), and represented an eighteenth instead of an eighth part. In ancient times the word was even frequently spelt "auchteen." Thus, under date 1600, is recorded an instrument of sasine of two-eighth parts of the lands called "auchteen" parts in Elgin in favour of David Torrie, burgess of Elgin. Similarly in 1632. These "aughteen part lands" of Elgin have long been a puzzle to the inhabitants of that ancient and worthy city. So far as I have looked into the matter, it appears to me that that burgh in very ancient times was in possession of a commonty to the extent of a davoch, that is, eight auchten parts, each auchten part consisting of 52 acres, and that in course of time each auchten part was sub-divided into eight parts, two of which, as a rule, were assigned to each of certain burgesses on payment to the town of a small feu duty. This seems probable when we learn that in 1801 the 64 aughteen parts consisted of 373 acres, which is less of a discrepancy from the normal number of acres in a daugh—416—than some of the cases we have been considering. The Burgh Court books of nearly 400 years ago contain regulations as to these "auchtene pairt lands."

One writer states that the ploughgate was virtually the equivalent of the hide or carucate, which in English measurement was 120 acres. Mr Airy held that the carucate in Bedford measured 90 modern acres. Thus 120 Domesday acres are equivalent to 90 modern acres. Mr Isaac Taylor gives four instances in "Domesday Studies" where carucate is equal to 12 oxgangs. Mr Henry A. Rye, Golspie, defines a carucate in Orkney as 240 acres.

Mr A. S. Ellis, Westminster, writes in "Notes and Queries" that there is full evidence that in

the eleventh century at least there had been a standard ploughland of 100 acres (or rather the English hundred of 120), and that this, with the pasturage for the eight oxen of the plough teams and a definite amount of meadow, made up the normal carucate. The words carucate and bovate were introduced by the Normans. In 1086, it was found in Yorkshire that where one carucate had been taxed for Danegeld, one plough was still sufficient for the tillage. This seems to indicate that the arable of the carucate remained in these cases one ploughland, but where we read that there were two ploughlands where three carucates had been taxed, it may be inferred that the land tilled had been found so productive that 240 acres yielded one-third more than the amount of corn and barley taken as the average produce, and so vice versa. Woodland was unmeasured. The carucate in Normandy seems to have been a certain definite area of arable at the time of the Conquest, founded on an average ploughland in the Duchy. A carucate was sometimes 50 acres; but this was so probably if the land was so fertile that a crop could be extracted every year from the whole area. The usual system of agriculture in England was that only half of the ploughland was growing corn one season and the other half fallow.

Professor Stubbs writes that the Domesday carucate is not the equivalent of the ploughgang (*terra ad unam carucam*), but an undefined area like hide, not dependent on acreage. But the ploughgang is a strictly defined area, implying 120 Domesday and the same number of statute acres. There were eight bovates in each "*terra ad unam carucam*."

About the year 1290, the lands of the Monastery of Kelso were measured in ploughgates, husbandlands, and oxgates where it was arable, while pasture land was measured by the number of sheep it contained. "*Carucata terrae*" occurs in writs of the twelfth century. The word *caruca* or *carucarius*, a plough, occurs in Bishop Hatfield's "*Survey of the See of Durham*," written c. 1382; hence came the word carucate, meaning as much land as could be tilled by one plough in a year. He gives a carucate as 120 acres in one district and 160 in another. In the latter

case he calls 8 bovates equal to 1 carucate, and 20 acres equal to 1 bovat.

From the Rental of the Bishopric of Aberdeen (1511), it appears that in the parish of Glass the farms of Dumeath, Lettoch, and Auchindoch were let for four pounds a plough in money, with certain additional payments in kind; but the boundaries and the amount in cultivation of these farms may have altered so much since four centuries ago that no useful inferences can be drawn by comparing the old rental with the present. The extent of the farms was measured by ploughs (aratra), bovates, or so many bolls sowing. The average rent of a ploughgate in Kingussie was £1 1s. 1d., and in Bellie £2 8s.

It was usually by "ploughs" that parish stents were laid. Thus:—1618.—The "plewchis" of the parish of Elgin "as they ar nominat for taxing the parochiners to furneis necessaris to the Communion." There were 50 ploughs in the parish of Elgin. The number of acres of all kinds of land is and probably was 19,258. 1652.—The schoolmaster received a firloft of meal from "each pluchland within the parochine" (Grange). This was the customary allowance in the North. 1660.—Ilk plough in Inverurie had to bring in a load of heather to repair the Kirk. 1671.—"Each plough was stented at 30s. for repairing the Kirkyard dykes and school walls" (Grange). 1730.—"Each pleugh in the parish pays 15s. Sc. for glazing the Kirk windows" (Grange). About the year 1650 the rent of Drum, in the parish of Keith, was three chalders; of Edintore, eighty pounds; and of Glengarrick, 72 bolls. Each of the three contained "ane pleuch." From 1660 to at least 1716, there were forty "ploughs" in the parish of Grange. The number of acres is and probably was 15,092. Thus a ploughland, if arable and non-arable are both reckoned, comes not far short of a davoch, which was reckoned at 416 acres. (Cf. Elgin "supra" with its 385 acres for a plough, and Grange with its 377 acres).

The writer of the Old Statistical Account of Colinton states that the old ploughgates in the parish were worked by four horses in the plough, and numbered 42. By 1798, these 42 four-horse ploughs were represented by 60 two-horse ploughs, the latter having been introduced into

that parish in 1770. Mr E. W. Roberston makes the following interesting remarks:—The equivalent of the ploughgate in the North of Scotland was the davoch, a large pastoral measure equal in actual extent to four ploughgates, or in the same proportion as the suling and the jugum, the large old hide of 240 acres, and the lesser measure of 60 acres. In course of time the davoch seems to have been calculated as a measure of land at four ploughgates; but it appears to have been originally reckoned like the suling, as the equivalent of the ploughland, and divided into eight oxgates, for by a regulation in the *Regiam Majestatem* no husbandman was liable to heriot unless he held at the least the eighth of a davoch; and the ordinary amount of kirktown or glebe assigned to the church in Morayshire and the north-east of Scotland was a half davoch. The ploughgate was the original qualification for a vote in the counties of Scotland, and upon the principle of the forty-shilling freehold in England, which represents the tenth of an old "feudum militis," or knight's fee of twenty pounds of land, the ploughgate originally represented the tenth part of twenty pounds of land or of a barony of ten hides.

From the Register of the Privy Council, and this is the view to which Skene adheres, it appears that four oxengate=two husbandlands=ane pund land of auld extent=one librate (a word seldom used). The possession of a ploughgate held of the Crown constituted the lowest freehold qualification, being in the valuation called "The Forty Shilling Land of Auld Extent," passed in the time of the Alexanders (some say passed c. 1190, and in force till 1474), and reckoned of the value of three merks or 40s. By Act 1681, c. 21, none were entitled to vote at elections but those who stood infeft of a 40s. land of old extent holden of the king or prince, or in £400 of valued rent. The freeholders' privileges as regards voting for members of Parliament in counties continued in force till the year 1832.

The word "plough" as a measurement continued in common use for a great part of the 18th century, e.g., 1719—"The town of Tarland contains four ploughs divided among eight persons. 1752—"Braco (in Grange) is reckoned two ploughs."

DAVOCH or DAUGH (Celtic, *damh*, pronounced *dav*, an ox, and *ach*, a field).—Jamieson's Scottish Dictionary gives *dawache*, *davoch*, and *davach* as meaning a small district, including several oxgangs. *Daughe* he calls a word used in the North of Scotland to signify a certain division of land determined by its being able to produce 48 bolls. A *davoch* is usually given as four ploughgates or *carucates*, i.e., 416 Scots acres. It was the usual division of land in Celtic times prior to the introduction of *bovates*, *carucates*, &c., in the Saxon polity. Chalmers ("Caledonia") says that in several districts of Galloway, Perth, Forfar, Aberdeen, Banff, Inverness, Ross, and Sutherland the *davoch* was equal to the *carucate* or 8 oxgang, that is, 104 acres. Assynt parish was divided into four *davochs*, and every *davoch* had eight oxgates. Kirkmichael (Banffshire) had ten *davochs*. The Lordship of Strathbogie had 48 *davochs*, with 32 oxgates in each. The *Regiam Majestatem* extended the *davoch* to four ploughs, each drawn by eight oxen. The statement that a *davoch* was equal to four ploughgates is said to be somewhat uncertain. The word *davach*, writes Professor Cosmo Innes, is not easily explained. In the oldest charters of the Bishopric of Moray a very great number of the parishes of the diocese had a "*terra ecclesiastica*" or *kirkland* of half a *davach* in extent. A *davach* was likely four ploughs. "Strathbogie was of old divided into 48 *davachs*, each containing as much as four ploughs could till in a year" (MS. at Slains c. 1726). Shaw (History of Moray) gives a *davoch* as four ploughs. A well-known toast in Strathbogie was the "*Aucht and forty dauchs*," alluding to the possessions of the Gordons in that district. Another definition of the term *davoch* is given by Pennant ("*Tour*," 1769). At Loch Broom, he says, the land is set by the *davoch* or half *davoch*, the latter consisting of 96 Scots acres of arable land, such as it is, with a competent quantity of mountain and grazing ground. This maintains 60 cows and their followers, and is rented for £52 a year. To manage this the farmer keeps eight men and eight women servants and an overseer.

A few illustrative extracts may be given:—

- 1187-1203.—Bishop Richard grants to Patrick, son of William, the Church of Abernethy, with the half davach belonging to said Church (Reg. Ep. Mor.).
- 1225.—Agreement between the Bishop and Robert Hod of the manor of Lamanbrid (excepting the church of said manor and a dauch of land belonging to said church (Reg. Ep. Mor.).
- 1226.—Composition with David de Strathbolgyn by which are granted to the Bishop all the churches of Strathbolgyn (except the patronage of Essy and Glass), and the lands pertaining to said churches, viz., half a davach each at Rynyn, Dunbanan, Rothuan, Kynor, Butharry, and Drumalgyn.
- 1203-1222. — Bishop Bricius granted “unam dauacham terre” of Aberchirder to the monks of Arbroath. A quarrel arose about 1492 regarding these lands between Alexander Innes de eodem and Master Alexander Symson, vicar of Aberkerdor. The arbiters, Sir James Ogilvie of Deskford and others, in giving their decision (1493), give the land pertaining to the vicar by bounding and not by measure, as if a davoch were not so many acres.
- 1309.—David, Bishop of Moray, grants to William, son of Adam, son of Stephen, burgess of Elgin, a half davach of Medilhalch in Spynie.
- 1328.—Confirmation of King Robert for William de Melgdrum of a davat of Westircaringusy.

“The lands of Cairne” (Cairnie), says Mr James Macdonald, Huntly, included four oxgate of Kirktown, four oxgate called Corss, four oxgate called Midtoun, and four oxgate called Yonderton, i.e., sixteen oxgates, or two ploughgates, or one-half davach of land. This land on which the church stands seems to be the half davach of the church land of Botarie in dispute in 1227 and 1232.

- 1393.—Charter of lands of forest of Cabrach and half davach of land of Auchmayre to William, Earl of Douglas. In the “Place Names of West Aberdeenshire” (New Spald. Club) Mr James Macdonald remarks under

the heading Haddo (Forgue), Haddoch (Cairnie), Haddoch of Coullie (Monymusk) :— Haddo or Haddoch is a contraction of Half-davach—two ploughgates of land. In a retour of 1680, Estir and Westir Haldachs of Ardmannoch are called the “Half-davachs, alias Haldachs.” Half-davach, Haldach, Haddoch, Haddoch, and Haddo are the most common forms of the name in the counties of Aberdeen, Kincardine, Moray, Nairn, Inverness, and Cromarty.

1554.—At an inquisition held at Bervie, reference is made to “terrae de Haddow” ; therefore, if Haddow is a corruption of Half-davach, the word davoch was once in use there. Cf., the “kirk daach” or ecclesiastical lands of Strachan.

1648.—The Lordship of Balvenie consisted of the davachs of Edinville, Ruddrie, Aberlour, Mudhouse, Newton, Achlunkart, Arbrodie, Easter and Wester Ardbreck ; also the half davach of Wester Gallvall and the half davach of Easter Gallvall. These davachs could not have been all of the same extent.

The word davoch or dauch was long in common use, e.g., in the Kirk-Session Register of Grange we find :—

1665.—“Many in the dauch of the Knock did not frequent their own parish church.”

1666.—“The men of the daugh of Grange.”

1714.—“Isabell Johnstoun said to Janet George, ‘There was not one in the Daach but would say she had geir of hers.’”

Other illustrative extracts may be given :—

1557.—“A davat of Edinglassie to John, Earl of Atholl and his spouse, Margaret Fleming.”

1646.—Captain Alexander Duff, son of Alexander Duff of Cluniebeg, was authorised by the Marquis of Huntly to levy one horseman for His Majesty’s service out of every daugh of Mulben, Strathisla, Grange, Rothiemay, and Ordiquhill.

1673.—“The half-davach lands of Belliehack.”

1750.—“The daugh of Cairnborrow,” “The daugh

of Invermarkie." (The rent of the former £1371, with 91 bolls victual, and of the latter £1583, with 470 bolls meal.)
1787.—"The davach of Grange contains 42 ox-gates or so."

In Kinnoir parish, now incorporated with Huntly, were four dauchs:—dauch of Affleck, dauch of Mickle Kinnoir, dauch of Auchinbo, &c. Rhynie and Essie are supposed to have contained eight of the "aucht and forty dauchs of Strathbogie." Seven of these eight were—(1) Lesmoir, Essie, Balhanie, and Affleck, constituting the dauch of Essie; (2) the Waterside; (3) Scordargue; (4) Rhynie; (5) Milton; (6) Smithston; (7) Noth, &c.

1901.—"The davach of Pethnick," in Grange, is in use at the present day, and the official name of a school in the parish of Edinkillie is the "Half-Davoch" School.

Scots ells, falls, acres, and chains are pretty generally understood, but "pace," or "space," is liable to be misunderstood, and a case which turns on the definition of this word is likely soon to come before the law courts. After searching into the matter, I have been able to find only one precise definition of the word. That was when, in 1707, the Town Council of Elgin appointed as "the standart in lyning the moss wards in all time coming," that they "compt ane Scots eln of 38 inches to the space."

A few other terms are occasionally met with. A "nummate" of land was one acre, and was in use chiefly in the west of Scotland, and perhaps Galloway. A "librate" was four bovates, but the word seldom occurs in the chartularies. A "denariate" was of a similar nature to a librate, and was in use also in the west of Scotland. A "virgate," "pertificate," or "rood," was a parcel of land, and is chiefly descriptive of lands in townlands. The word pertificate is oftener used than virgate, especially in the S.E. and some other parts of Scotland. From the Register of the Bishopric of Aberdeen it appears that in the year 1468 David Rossy of Rossy granted to Mr Duncan Lychton, Chancellor of Aberdeen, three roods or pertificate of land in

the burgh lands of Banff, near the land of the Blessed Virgin Mary, commonly called Maryland. In a Cullen deed of date 1541 occurs "a particate of land called Clayloch." Of the same nature is the "petia terre," or piece of land. In the west and north of Scotland, in districts inhabited by the Celtic races at the time of the Old Extent are mark lands, half mark lands, shilling lands, penny, half-penny, and farthing lands. Orkney and Shetland have merk lands, and other like terms derived from Scandinavia. Logan's "Scottish Gael" states that in the Highlands and Galloway a penny land is generally eight acres, a farthing land two acres, and an octo is one acre or a boll's sowing.

Pennant, in his "Tour" (1772), informs us of the penny lands in Canna and Rum. In Canna he says the factor rented most of the island, paying two guineas for each penny land, which he set to the poor for four and a half guineas. The sum of £30 was required to stock a penny land, and it maintained seven cows and two horses, while from the land the tenant raised yearly eight bolls black oats and four bolls bear.

In the West of Scotland five penny lands made a ploughgate and 20 penny lands a davoch.

It must not be supposed that Scotland was singular in ancient times in the uncertainty of its land measures. Even in the higher civilisation of England, the virgate was very variable. Hore, in his Explanation of Ancient Terms, says that the virgate is supposed to have been equal to the yard land, i.e., 20 to 30 acres; but it was different at different periods. Dr Nash says in Henry V.'s reign it was 15, 24, and 30 acres. Randle Holme says it was generally 20, sometimes 24 and 30 acres. White Kennett says that a Wimbledon virgate was 15 acres; but in Henry III.'s reign two virgates in Chesterton contained 90 acres. In the 13th and 14th centuries virgates varied between 18 and 36 acres.

A vote of thanks to Dr Cramond for his excellent paper was very cordially passed.

THE MOUNTAIN BUCKLER, OR LEMON-SCENTED FERN.

(*Lastrea Oreopteris*) Bory.

A paper on this subject was read as follows by Mr Wilson, Terpersie, Alford:—

While ferns can claim their full share of admirers among those interested in the vegetable kingdom over the length and breadth of its environments, there are two points generally absent in them which occupy a prominent place among the attractions of plants. I refer to flowers and smell. Nevertheless, as in other things, we find exceptions, in a form at least, to the general rule, for as regards flowers we have various productions approaching flowers among the representatives of the fern order.

While in the solitary case, in as far as our Caledonian ferns are concerned, of the Mountain Buckler (*Lastrea Oreopteris*), we have a representative which emits a most agreeable smell, resembling that of lemons; and we find added to the original name, at a later date, and doubtless upon that account, the sobriquet of Lemon-Scented Fern—and we may add the title is appropriate, much more so than the standard name, if we may use the phrase, as it denotes something of outstanding strength, durability, or pre-eminence to mountain strongholds among our ferns. Our subject, however, can lay no claim to such position. Its scent is its outstanding feature. While it is the weakest or most delicate of all our Buckler or Shield Ferns, it is the latest in making at least prominent appearance in spring, the easiest to damage by cold winds or late spring frosts, and the first to fade in autumn or the fall. The name mountain, however, I may add, is the interpretation from the specific name, which latter is of Greek origin. Probably, when the Greeks were taking note of ferns this one may have been conspicuous upon their mountainous grounds.

Beginning at the roots of our subject we find blackish-coloured wiry threads holding firmly by the soil, the latter often of the poorest possible

nature. While the caudex, the peculiar portion of ferns situated between the roots and fronds, is inclined to be thick, but varying this way greatly according to the age, situation, and other things connected with each particular plant, it almost always takes a more or less drooping form. But, owing to the variety of situations where it is found, it is difficult to say how far this holds good. Thus, in a plant which is usually found growing upon moderately sloped ground, it can easily be learned what is the natural form which the parts of that plant take in course of development; but in the case of our subject, where the place of growth varies so much, sometimes upon the level, at others wedged among stones, and anon emerging from the face of a precipice, it is impossible to say what is really the form or angle which best fits the development of this fern. The stipe or stalk varies a good deal in length, according to situation, as well as in thickness. We find fully equipped fronds a few inches long, and they reach over two feet, while the rachis or branchlets which form the centres of the frond vary in length according to that of the former, being in the natural form of the frond, short at the foot, appearing alternately upwards, and getting gradually longer up to the centre of the frond, where or thereby they commence to be narrower as they run upwards towards the top of the frond, where the point is reached. Commencing at the bottom, nearly opposite, they diverge in greater measure upwards on the frond until a certain point, when they again change front until they become opposite or nearly so, keeping this position, or again diverging up to the point. Frequently variations in this occurs, but such is the general rule of form in normal fronds.

Then the scales are numerous upon the stipes; but there are only few on the rachis, and these in many cases are nearer being only hairs than scales. In all cases they are pale in colour, being often nearly white. The fronds are lanceolate in shape, and taper much towards both ends. The pinnae or branches are deeply pinnatifid, that is, they are not so deeply cut as to reach the rachis, but nearly so. They vary greatly in height and dimensions, but seldom reach over three feet, about one-half of that being about

an average, and the width would vary from four to eight inches at the widest points. The fronds are usually yellowish green, having a dull appearance and paler in aspect than any British fern in the North with one exception, which is similar in colour. The texture is rather thin.

But the most remarkable part of this plant is the stalkless glands with which the fronds are clothed on the under side. They are small in size, and are generally present where the fern can develop in any sort of shape. They have been variously described, one definition being resinous or glandular dots on the under side of the fronds. The latter, we may here notice, commence, but in very small form, at the very bottom of the stem, and the glands practically commence with them. It is in these glandular dots that the scent exists, which is compared to the strong smell of lemons, and may be felt at any time where the fern is growing, varying more or less with the nature of the weather, probably best felt in dew or moderate sunshine, vanishing in some degree with extreme drought, to appear strongly with a refreshing shower. This all refers to the fern without touching it; but, when the fern is bruised, the scent can be felt on the hands at all stages and in all weathers, from the emerging of the plant in spring, until the fronds wither away in the succeeding winter, for a shrivelled up frond when bruised between the fingers will give out smell.

It is rather late in commencing to unfold in the spring, and resembles a ball bristling with recurved points. It grows rather rapidly, and, being weak in durability, is as easily destroyed with cold autumnal winds or early frosts as any of our ferns, or late spring frosts leave their mark upon young plants of this one as severely as on any represented here. It is, however, a good drought resister, compared with its durability under previously mentioned conditions. As regards the venation of the fern, a wavy vein goes from the mid vein into each lobe of the pinnae; from it again branch venules and at times veinlets in the larger lobes, the latter being branches off the former. We find both on the venules and veinlets nearest to the vein what is called the receptacle, that is, an enlargement where the sori and spores or seeds are situated. As

in every species of *Lastrea*, they appear on the surface, and not on the sides of the vein or its branches. They are somewhat round, but soon all join together in one common mass, there being about fifteen to each lobe, the term applied to each division of the pinnatifid frond, and appear near the margin of the latter. Besides the spore case, or thecae, a bundle of which is called a sorus, there is present on some ferns a covering for their seeds, which is called an indusium, generally believed to be a continuation of the outer skin of the frond; being an important factor in distinguishing ferns, and being most in evidence in the early stages of growth. It does not always occur on our subject, and when present dies away early. It is smaller than the sorus, kidney shaped, and jagged on the edges. It occupies a rather peculiar place in connection with the part the indusium plays with it. The spores are not comparatively numerous, a large percentage of the fronds not producing any at all; still, when conditions are proper for the plant's development, each frond has a pretty large proportion of spores.

Beyond variations in the positions from which the branches emerge from the stems, little variation appears among them. I cannot say that I have seen an indigenous forked or crested frond of this fern. They seem to be remarkably uniform, though very susceptible to situation. Of course, I am not referring to pure dimensions, as they vary greatly that way according to situation. It is nowhere sportive, and has the distinction of having long defied searches for varieties. But latterly crowned with success. We have Mr Barnes, of Leven's singular find of a variety, which stands alone so far as is known, where the pinnae are set at right angles to the stalk. Then, of course, other forms have been enumerated, some natural, some artificial. It requires some care in cultivation, but grows under a variety of conditions. Frequently the scent is not so pronounced. We find it growing in a variety of natural situations, which may be briefly defined as follows—pastures, woods, rocks, and last, but not least, alongside or near streams, as well as general heathy situations. As already noted, it is not a mountain fern in the Alpine

sense of the term, probably reaching over 2000 feet above sea level, neither is it abundant in the general sense, at least near sea coasts, but finds its standard haunts in intermediate space from those two. It is found over all the counties included more immediately under the notice of the Northern Societies; also over Scotland except Haddington and Linlithgow, as recently published; but the probabilities are that it is, in part at least, from want of observers that it is not known to be there. Its general range is defined as over temperate Europe, and recorded also from North America; finds its way no doubt to various parts of the globe by admirers, and so on. It appears in company with other ferns, and often solitary.

Perhaps the foregoing may not be quite up to my usual standard; still, with the present attempted stimulus to Nature study, it seems to me to be a most appropriate subject to strike out upon, for the odour of plants always has exercised a powerful influence as regards the vegetable kingdom, and it seems to me that such an interesting thing as this solitary smell-producing plant of its genus, from the local standpoint, is a suitable subject for giving attention to. I have not heard of conclusions having been arrived at as regards how this peculiarity occurs. In fact I do not know if elaborate investigations have ever been entered into in the matter at all. But as a recreation, either with the view of remaining so, or with following a more pronounced knowledge of the ferns, the interest attached to the odour alone could be put to good account in searching out this fern in all parts.

No doubt a little of this recreation would soon lead to increased attention to other ferns, putting it in the narrowest light; so we add other plants or things as well, because there seems to me to be something likely to increase interest permanently in this form of study, following the one plant and in this case, and directing attention right and left to others.

On the motion of the Chairman, Mr Wilson was heartily thanked for his paper, and Mr Wilson, in acknowledging, remarked that it was the fruit of personal study.

SCOTCH HERALDRY.

A paper on Scotch Heraldry, by Mr John Milne, LL.D., Aberdeen, late of King-Edward, was read as follows:—

Modern heraldry is little more than an elaborate, State-regulated scheme of ornamental, private marking by which one person and his belongings can be identified and distinguished from all other contemporary persons and their private property. When heraldry began the marks were used by military knights upon their shields and upon *camisiae*, short-sleeved coats like chemises, worn above their close armour, and hence they are commonly styled shields, or coats of arms; sometimes armorial bearings, coats, or arms. At present arms are chiefly seen on castles, mansions, statues, carriages, buttons, seals, books, stationery, and table silver. Thus far arms are personal to the user, and concern only himself and his friends; but since they are hereditary and descend to blood relations, they are often useful to historians, genealogists, and antiquarians.

Anciently, besides their chief purpose of enabling a military commander's followers to know him in battle though his face was hidden by his helmet, they gave a sure means of authenticating documents by seals. A drawing or a verbal description of every Scotch coat of arms can now be found in published books, and a shield of armorial bearings built into a bridge, or carved on the wall or the mantelpiece of an old castle, indicates the builder and often also fixes the date.

In most civilised countries—the United States of America being a notable exception—heraldry has been thought of so much importance that laws have been made and officials have been appointed for regulating armorial bearings. Though the laws and practice of all countries are much the same in heraldic matters, yet there are some points in which every country has its own peculiarities, and anything now said must be understood to refer only to Scotch heraldry.

Something of the nature of arms has doubtless existed since the world began. As soon as several persons using similar

tools united together in any work, they must have put distinctive marks upon them to enable each man to know his own. We read of signets and seals in the Bible; the tribes of Israel had each its distinctive symbol, and in Jewish cemeteries the tribal mark is often seen carved upon tombstones. In Egypt there are on buildings and tombs marks called cartouches, consisting of a few hieroglyphic symbols with encircling lines, by means of which the work or the sepulchre of every King who ever reigned in Egypt has been identified. The immense number of intaglios and cameos engraved on precious stones by the ancient Greeks and Romans were probably all intended for use as private seals. But these were all personal to the individuals who adopted them, whereas it is a prominent feature, though by no means an essential one, of heraldry that armorial bearings are hereditary and descend from father and mother to sons and daughters. Any person can dispense with his ancestral coat of arms altogether, and procure another for himself. Further, no one can assume arms at his own hand; they must be granted by the sovereign or by his authority, and they cannot be borne by any one who is not noble or a gentleman. In heraldry noble and gentleman are equivalent terms. A recent writer on heraldry asserts that to be a gentleman one must himself have obtained or be descended from some one who had obtained from the sovereign, or some one armed with his authority, a document constituting him a gentleman and ennobling him in his blood. Of nobles there are two grades, the higher embracing those with hereditary dignity, baronets and all of higher rank and their descendants; and the minor comprehending those to whom have been granted letters-patent, along with grants of arms, ennobling them in their blood. It is sometimes said that a grant of arms makes a man a gentleman, but this is not the right way of putting it. A man may be ennobled without getting a grant of arms, though he is then in a position to claim them and wear them; but he cannot claim or wear arms without being ennobled. The descendants of the higher nobility are themselves nobles, but only those in actual possession of the hereditary dignity are entitled to assume at their own hand

the arms granted along with the dignity. Sometimes the patent of a dignity contains a right to the grantee to nominate a successor in the event of failure of descendants. In such a case, the successor might be a peer without being a nobleman, and so not entitled to bear arms. Cadets of a noble family though noble are not entitled to assume the family arms at their own hand, but are entitled to claim a grant of them with a difference. Among minor nobles are knights of all ranks, all those to whom have been given letters-patent ennobling them in their blood, and also university graduates. Segar, a writer on dignity, says—"Doctors and graduates in universities do merit to be ennobled and to become gentlemen." Guillim's Heraldry says—"A spiritual dignity makes a man a gentleman, but not of blood, but if he be a doctor of civil law he is a gentleman of blood." Originally university degrees were granted by a chancellor representing the Pope, and a diploma of any university entitled a man to teach in any other university in Christendom. Since the Reformation, the chancellor represents the sovereign, and his diploma may itself be regarded as a grant of nobility. It is said that a clergyman must be made a doctor before he can be made a bishop. This may be a matter of fact, or merely a matter of expediency, as otherwise he would be inferior in dignity to those of his clergy who were doctors, and in England this would be conspicuous by hoods and gowns worn when on duty, also his right to bear arms would be merely official and cease on his retiring from office. But few university graduates claim their right to grants of arms.

The introduction of the modern system of heraldry was without doubt contemporaneous with that of the feudal system of holding land for military service, and like it must have been gradual, a step being taken every time there was a change in the landholder, which was accompanied with the assumption of territorial armorial bearings. Heraldry had not begun at the time of the Norman Conquest of England in 1066. There is nothing of heraldry to be seen in the Bayeux tapestry, a narrow sheet of linen an eighth of a mile long, on which are embroidered the chief scenes of the Conquest. Neither had

it begun at the time of the First Crusade, thirty years later, though it contributed to its introduction. The congress in camps and on the battlefield of vast bodies of illiterate men who could not read nor understand one another when they spoke necessitated some pictorial method of distinguishing their leaders and of knowing friends from foes. Before the Second Crusade, eighty years after the Conquest, heraldic bearings had been devised in Germany and France. In Scotland the beginnings of heraldry may be put about 1124, when David I. became King, but it needed the impulse of the War of Independence, coming after the death of Margaret the Maid of Norway, to make it anything general. There never was in Scotland the same enthusiasm for heraldry as on the Continent and even in England, hence the technical terms and the phraseology of the Science if it may rightly be so called, are more French than Scotch, and an old French dictionary such as Cotgrave's, 1611, must be consulted for the meaning of heraldic terms. In some countries Latin is used in describing heraldic bearings, but French is more precise. In the time of King Robert Bruce there was a dispute regarding arms in the King's presence, which shows that the Sovereign had begun to take concern with the assumption and wearing of arms. In 1371, at the accession of Robert II., the coronation ceremonies were regulated by an official styled Lyon King of Arms, and ever since the Sovereign has appointed a Lyon King to be supreme authority in all heraldic matters. The royal coat was a lion, hence the name of the officer. At present the Lyon has under him six heralds styled Islay, Rothesay, Marchmount, Albany, Ross, and Snowdown; and six pursuivants, Kintyre, Dingwall, Carrick, Bute, Ormond, and Unicorn. One of the pursuivants takes his title, Carrick, from the earldom held by the Bruces, and the first pursuivant of the name may have been appointed by Robert I. Other officers, Rothesay and Bute, bear the names of fiefs belonging to the High Steward of Scotland, and may have been originally created by Robert II., the first Stuart king. Marchmount is first mentioned shortly before 1500, and as unicorns first appear in Scotch heraldry on the walls of King's College, Aberdeen, begun to be built in

that same year, Marchmount and Unicorn may have been first appointed by James IV.

Heralds are sent on important messages by the Sovereign, and to cite persons to appear before Parliament. They also make proclamation of anything which the Sovereign has to announce to his people. In 1854, happening to be in Edinburgh when the news of the battle of the Alma arrived, I saw two men dressed in red and white, wearing bonnets, cloaks, and knee breeches, take up their station at the circle of stones in the pavement marking the site of the Cross of Edinburgh. One, a pursuivant, blew a blast with a trumpet to command attention. The other, a herald, read an announcement by order of the Queen that her troops had gained a victory at the river Alma; the pursuivant blew another blast, and all was over in a few minutes.

In 1542 Sir David Lyndsay of the Mount was Lyon King, and he prepared a book of coloured drawings of all the coats of arms known to him in use in Scotland. In 1592 an Act of the Scotch Parliament was passed enjoining the Lyon King and his heralds to visit all persons claiming arms, and to register them if found correct. They did very little, and in 1630 the Scotch Parliament approved of Sir David Lyndsay's book of arms as a correct statement of the arms lawfully borne at the time when it was made, and a few years later the Lyon was ordered to make an official record of all arms granted by him, to be presented to the Privy Council. Nothing seems to have been done, and other Acts were passed, one in 1672, ordaining the Lyon, Sir George Mackenzie, to visit the whole arms of the nobility, barons, and gentlemen, and to matriculate them in registers. Heavy fines were to be imposed on all who usurped arms without matriculation, and all goods and chattels bearing false arms were to be escheated to the crown, and offenders might be put in prison. Hence it follows that no person in Scotland has the right to bear arms unless they are registered in the books of the Lyon King. The Act of 1592 was ratified by this new Act of 1672, and by it no younger brother or cadet is allowed to bear family arms except with a distinction granted by the Lyon, and no one is allowed to bear the arms of a noble family unless

he can prove descent from that family. This prevents the Lyon from granting arms in Sir David Lyndsay's book to any person who cannot prove descent from the family bearing them in 1542. This is a useful regulation, since one of the uses of heraldic bearings is to trace descent and family connection. The only person who can assume arms in Scotland without the intervention of the Lyon is the male head of the family, who can, if he likes, take the arms of his predecessor on his death, but if he do so he must neither add to the bearings nor omit any part of them, nor change any colour. If there is no son, paternal arms may be assumed by daughters, co-heiresses, not on a shield but on a lozenge or rhombus, all exactly as their father bore them. When they marry, their husbands, if already in possession of a coat of arms, may either put their father's shield alongside their own, or put the coat inside their own shields, but separated from their own coats by a vertical line. This requires the width of both coats to be reduced one half, and has an unpleasant effect. Younger sons may, on application to the Lyon, get a grant of their father's arms with some mark of distinction added, change of colour, substitution of one device for another, without much altering the appearance of the shield. In England, the son of a person who marries an heiress may at his own hand divide his father's shield into four quarters and put his father's arms into the first and third quarters, and his mother's into the second and fourth; but this is not allowable in Scotland without leave of the Lyon. Hence shields are usually much simpler in Scotland than in England. It must be noted that it is a fiction of heraldry that the shield represents the person or body of its owner, and right and left in heraldry refer to the shield, not to the person looking at it. If a man is not ennobled he has no shield and cannot make use in any way of his wife's arms, nor can his sons. In Scotland, however, some of the old earldoms were descendible to female heirs, and in that case their husbands became during their lives earls, and bore their arms; but this right ceased on the death of their wives, and passed to the next heirs. If an armigerous person marry a lady in her own right entitled

to bear arms, though not an heiress, then he may put her shield on the left of his or impale it. Thus the Duke of Fife, being entitled to bear arms, puts a little behind his own shield on the left side, heraldically speaking, another shield bearing his wife's arms, which are her own by grant. Her arms are not borne by herself on a shield, but on a lozenge or diamond. They are the same as those borne by her father when he was Prince of Wales, with a label across the top for a difference; and the Prince of Wales bore his mother's, the Royal Arms of Great Britain and Ireland, with a small shield of pretence in the centre, having on it the arms of his father, Prince Albert of Saxe-Coburg-Gotha. Besides individual persons, public bodies and corporations, such as cities, universities, banks, railways, county and parish councils, may obtain armorial bearings to be graven on seals and stamps to mark their property and authenticate their documents. The city and the county of Aberdeen have registered arms. The insignia of Banff are carved on a stone in a wall at the Plainstones. They are the Virgin Mary and her Babe in her arms; but they are not registered as arms.

There are two popular errors regarding arms. First, that illegitimates must wear their father's arms with a diagonal line across the shield from left to right downwards. This seems to have arisen from the arms worn by the illegitimate children of Charles II., which were the Royal Arms differenced by a diagonal line. Had they chosen they could have got other arms for themselves, but none approaching nearer to the Royal Arms. Novelists often euphemistically hint that a hero is a bastard by speaking of a bar sinister on his shield. A bar in a shield is the same as in a gate—a broad, horizontal line, neither sinister nor dexter, and is seldom used as a difference by illegitimates. Anyway it has no special meaning. Another is that there is already in existence a coat of arms for every name, and that if it can be discovered any person bearing the name is at liberty to assume the arms. This is not the case. Every coat of arms was the private property of the person who assumed it in early times, or got a

grant of it in later times, and if his representatives are alive they could prosecute any person who assumed the arms. A question in the House of Commons might lead the Lyon to interfere in any glaring case of heraldic thieving, but he seldom takes notice of heraldic offences. Recently a private individual, named Fox-Davies, has for his own private ends taken upon himself to pillory in print all who assume arms without being noble, or, being noble, assume arms to which they have not a legal right. Hitherto books containing the family history of the nobility, gentry, and notable persons have added their arms as supplied by themselves in answer to inquiry by the editors, and no questions have been asked. But Fox-Davies is more cunning. Remembering that every person who wears arms thereby asserts that he is a gentleman, he examines his claim and boldly publishes the result. He has printed a large volume giving in Roman type the family history and arms of every person whom he finds entitled to the arms which he wears; and in Italic type he gives those who, being baronets or knights, have been made gentlemen and might lawfully wear arms but do not; and also those who wear arms to which they have no good claim. These last are virtually stigmatised as "no gentlemen," either because they have not been ennobled, which is no disgrace, or because they have taken what does not belong to them, which is criminal. Of course, the editor well knows that he has mortally wounded the vanity of these, and that his volume will not be found on their drawing-room tables; but he knows also that the armorial bearer with a "*mens conscia recti*" will prefer his book. Already, it is said, many offenders have procured new coats, or obtained a legal right to the old coats which they have been wearing.

There are already, it is estimated, 20,000 registered coats of arms in Europe; but there would be no difficulty in doubling the number. It could be done with crosses alone. There are more than a hundred different crosses; these may be of more than ten different colours or grounds, and they may be placed on as many kinds of shields. This would make ten thousand, and then there may be either one cross, or three,

as a usual thing, which gives 20,000. But there are besides crosses more than a hundred other charges in more or less common use. Some of the older coats bore reference to lands and castles, as sheaves of corn, fishes, swallows, indicating extensive domains; some, called canting or parlantes, referred to the name or office of the bearer. Frasers took strawberry flowers, because "fraise" is French for a strawberry; Geddes took a pike-fish, because "geadas" is a pike in Gaelic; Skene took three knives with wolves' heads on the points, because the Gaelic for a knife is "sgian"; Drummond took wavy bars, because the end of the name resembles "unda," Latin for a wave; the Butlers have three wine cups, in reference to their office; the Stewarts have a band across the middle of a shield on which are three rows of squares alternately white and blue, to represent the counting board used in adding up household expenses before the introduction of the Arabic numerals. The shield of the North of Scotland Bank is well chosen. Its ground is wholly covered with cheques to represent money transactions on a grand scale; St Andrew's Cross tells that it is a Scotch institution, and the three castles show that the head office of the bank is in Aberdeen. The motto, "Ne Nimium," is a warning not to be too greedy, not to make a bad investment for the sake of high interest. Bishop's official arms often have keys in various positions to indicate their relationship to the first Bishop of the Christian Church.

One reason why I selected this subject as suitable for the present occasion is that heraldry may help to throw some light upon the mysterious Sculptured Stones of Scotland, so interesting to Antiquarian and Field Clubs. The majority of those which I have seen, and I have visited a great number of them, have two symbols which seem to show that they refer to a high ecclesiastic, as plainly as the cross keys of the bishopric of Cork. On the Maiden Stone of Bennachie, and many more, there are a round mirror, with a handle on the lower side, and on the right hand side of it there is a comb with a row of teeth on both sides, sometimes only one on one side. Before the Reformation eccle-

siastics made bare a part of their head, and it is well-known that the early Celtic Church had a different way of the tonsure from the rest of the Western Church. This proves that attention to the hair was a matter of some importance, and in Cathedral Churches there was a special comb for the use of the bishop to trim his hair before celebrating high mass. I believe that the mirror and the comb intend to tell us: "This stone was erected in memory of a high dignitary in the Celtic Church of Scotland."

Those who wish to discover the owner of a coat of arms will find Balfour Paul's "Ordinary of Scottish Arms" useful. It contains alphabetically arranged all the charges seen on coats of arms that have been registered in the Lyon Office, and gives their owners. The earlier registrations are undated, the later have the dates of registration. Sir David Lyndsay's "Book of Arms" has been edited by David Laing. It gives coloured figures of all the arms in his book, with the names of their owners. Two other volumes to match it have been edited by R. Riddle Stodart, containing coloured drawings of all the Scottish arms found in various other heraldic books, some of them older than Sir David Lyndsay's. "Nisbet's Heraldry," two vols., contains plates and verbal descriptions of the arms in use in Scotland about 1700. Fox-Davies, as already mentioned, has published a book of family histories, containing all the arms borne in Great Britain and Ireland at the present day.

A vote of thanks to Dr Milne was cordially passed.

THE BOTANY OF BOYNE DISTRICT.

Mr George Thomson, M.A., Kindrought, read the following paper on the Botany of the Boyne District in Banffshire:—

It may not be possible to claim for the Boyne that it possesses any distinctive features of botanical interest; yet in the general variety of its plants it will bear favourable comparison with the other districts of the county, and may serve

as a typical Banffshire locality. The list sub-joined is compiled and offered in the hope that under the auspices of the Banffshire Field Club it may lead to a systematic classification of the county flora with more scientific care than given by me on my rambles. While desultory lists of some small district may be uninteresting, a semi-official guide to the flora of the county would be of value.

As a simple list is apt to be misleading, I may be allowed to prefix a few remarks with regard to the habitat and relative abundance of the most notable.

But first, with regard to the absentees—Mare's Tail and Foxglove. The former may be present in the district; but, so far, I have failed to find it. The latter is not present, and this is scarcely less than remarkable, from its abundance in similar localities to the east and west, and the previous existence of a castle garden in close proximity to the glen.

Traces of the orchard are still apparent in the gean, crab-apple, and plum trees, which, along with one tall, scraggy, wind-blown holly, struggle on in the hollow to the south of the ruins; and to these ruins again we are indebted for the presence of Pellitory-of-the-wall, a nettle with hairy flowers in the axils of the leaves, with curiously-jointed elastic filaments for the dispersion of the pollen.

Along the valley of the Boyne burn, one of the most plentiful of flowers is an introduction within recent memory—the *Mimulus*, or Yellow Monkey flower, now abundant enough to be fairly termed a denizen; and another evident garden escape, the Myrrh, is also found abundantly along the whole course of the stream. Other escapes, more or less evident, I may note in the Aromatic Tansy; Alexanders, an Umbellifera growing to the height of 4 to 6 feet, on a shady bank opposite the old Boyne Flour Mill; Toad Flax, in a haugh a little further down the course of the burn; and Alkanet, which shares with the Greater Bird's foot trefoil, the distinction of being represented in the district by a single bush.

Among the indigenous plants are to be noted the Cardamines, the common Cuckoo flower, with

the rarer Bitter Cress with its loose corymbs of conspicuous white flowers with purple anthers; the Water Radish; the Geums, the two forms of which, urbanum and rivale, have crossed to form the intermedium, a hybrid species with, generally speaking, the colour of the former and form of the latter; the square-stalked St John's Wort, with more rarely the hairy species of the same; the Meadow Crane's Bill in great profusion, with a smaller variety, the Wood Crane's Bill occurring once directly below the Castle; and, nearer the mouth of the burn, Golden Rod, and Common Gromwell; and, in the very stream itself, the Water Fig-wort, a tall branching plant with inconspicuous flowers. Opposite the Castle, under a hedge at the top of the bank of the burn, lies a thick bed of Moschatel, with quaint, dice-shaped flower-heads, the only trace of it in this district. On the beach to the east of the mouth of the Boyne may be seen the Sea Milk-wort, with flesh-coloured flowers, growing not in salt marshes strictly so called, but in muddy places along the coast and very plentiful; and on a sandy stretch a little further along, the Sea Gromwell, or Oyster Plant, with, more abundantly, the Sea Purslane. On the same stretch may be seen a few plants of the Sea Rocket, with fleshy pinnatifid leaves, and heads of large, lilac flowers; and here also a year or two ago grew a single plant, which has unfortunately since disappeared, of Salt-wort (*Salsola Kali*), rare, at least, to me. Higher up on the seashore may be recognised the Sand-dune Meadow-rue, and the beautiful Grass of Parnassus on the wetter muddy spots, with its staminodes consisting of fan-like scales, fringed with white hairs, and terminating in yellow, wax-like glands, the beauty of which to be appreciated must be seen through a magnifier. The classification of this plant seems to give botanists a little trouble. By some classed with the Hypericums, by others with the Droseraceæ, it has now found a resting-place, for the present at least, among the Saxifrageæ.

In the surrounding fields, along with the commoner weeds, occurs the little red Pimpernel, the Poor Man's Weather-glass, from the fact that it opens only in bright weather, abundant enough, but difficult to find from its comparative

insignificance; at the edges, the Sneeze-wort is not uncommon; and amongst the crops themselves may be found the three most showy of our local weeds, the Corn Chrysanthemum, very abundant in places, which, it may be interesting to note, is said to have been unconsciously introduced from Enzie by one of our most prominent farmers, its first appearance coinciding with his arrival—post hoc, ergo propter hoc! the blue Corn-flower; and more sparingly, and, rarest of all, the Corn Cockle, now only to be found in this district in the fields east of Boyne mouth. Corn Parsley also may occasionally be met with in fields in the western part of the district, but is rare.

Along the roadsides, the Veronicas are well represented—the most common, the Germander Speedwell, readily distinguished by the trait it has, in common with the Common Chickweed, of having a singular pair of hairy lines, traversing the whole length of the stem, and shifting from side to side whenever they arrive at a fresh pair of leaves; and the rarest, the Marsh Speedwell (*Scutellata*), which occurs once at least in a ditch at Highfield, near Fordyce.

The Vetches are common, particularly the Tufted Vetch; the red Geraniums and yellow Rattle equally so; more rare, the St John's Worts, *pulchrum* and *perforatum*, the former of which may be distinguished by its free sepals, fringed with minute black glands. Abundant also in one or two places is Red Bartsia, a dingy, herbaceous plant with one-sided spikes of small pinkish flowers. The Bed-Straws are also greatly in evidence; although Cross-wort, with leaves four in a whorl and minute yellow flowers in the axils, occurs only once, on a bank near Portsoy Railway Station.

In the Roughilly wood, chief interest lies in the Red Rattles, both varieties occurring; the Chickweed Winter-green, and the Intermediate Winter-green, formerly classified with the Bird's Nest family, but now included among the Heaths. Another plant of interest, and abundant, is the Butter-wort, with a long-stalked, pale blue flower, rising from a flat rosette of fleshy, viscid, greenish-yellow leaves, which absorb for the nourishment of the plant the juices of the insects

caught upon the sticky surface of the leaves. Another fly-catcher, the Sun-dew, is also said to have been found in this wood, and is certainly found in one or two places on the hill of Durn, a little reddish plant, with its leaves covered with glandular hairs, exuding, especially when the sun is shining, a viscid fluid, the whole plant appearing then as if tipped with dew. When a fly is caught, this fluid becomes acid, and the hairs, spreading at first, bend towards the centre of the leaf, where the fly is digested, and absorbed by the plant. Four species of Orchid are scattered through the wood—the Early Purple, Marsh, Spotted, and fragrant white Butterfly Orchid. There were traces of a fifth, the Good-yea; but at present it seems to have disappeared.

Another place of interest is the moor on the Hill of Arnboth, near Portsoy. Here, along with others already noted, may be seen the Mountain Cudweed, an everlasting scarcely appearing above the turf, with heads 2—5 in a corymb, rendered conspicuous by the white or rose-coloured involucre. The sweet-scented Orchid is in great profusion; and in a swamp somewhat lower down the hill-side the Asphodel puts forth its tuft of sword-shaped leaves, and spike of yellow, star-like flowers. The name *Ossifragum* (bone-breaking) was given to this plant from its being supposed to soften the bones of cattle that fed on it.

On a sandy stretch beyond the hill, we meet again the Meadow-rue; and here are also the Red Hemlock, Stork's bill, the little Bur Medick, and the Hairy Mountain *Oxytropis*, its large, bluish-purple clover-heads showing above the turf. Another manifest introduction, the Bitter-Sweet, with purple and yellow flowers, succeeded by scarlet fruit, and narcotic leaves, has found a congenial resting-place on the banks of a small burn at the western end of this stretch.

The subjoined list of flowering plants of the Boyne, to which I have added a list of grasses, may be taken as a fairly correct list of such, as they strike the eye of the rambler; and has no pretensions to completeness in such orders as the Crowfoot and *Hieracia*, which require closer scientific study:—

LIST OF FLOWERING PLANTS IN THE DISTRICT
OF BOYNE, WITH REMARKS THEREON.

The flowering plants of the district of Boyne,
Banffshire:—

RANUNCULACEÆ—BUTTERCUP FAMILY.

Thalictrum dunense—Sand-dune Meadow-rue.

On sands at mouth of Boyne, and Sandend.

Anemone nemorosa—Wood Anemone.

Ranunculus aquatilis—Water Crowfoot.

„ *hederaceus*—Ivy-leaved Crowfoot.

„ *Flammula*—Lesser Spear-wort.

„ *acris*—Common Buttercup.

„ *repens*—Creeping Buttercup.

„ *bulbosus*—Bulbous Buttercup.

„ *Ficaria*—Lesser Celandine.

Caltha Palustris—Marsh Marigold.

PAPAVERACEÆ—POPPY FAMILY.

Papaver Rhæas—Common Red Poppy.

FUMARIACEÆ—FUMITORY FAMILY.

Fumaria officinalis—Common Fumitory.

CRUCIFERÆ—CABBAGE FAMILY.

Nasturtium officinale—Common Water Cress.

„ *amphibium*—Great Water Radish.

Cardamine amara—Bitter Cress. Banks of
Boyne.

„ *pratensis*—Cuckoo Flower. Bogs.

„ *hirsuta*—Hairy Bitter Cress.

Artemisia vulgaris—Mug-wort. In fields and
ditches.

Tussilago Farfara—Colt's Foot.

Petasites officinalis—Common Butter-bur.
Near Tochineal.

Senecio vulgaris—Groundsel.

„ *Jacobcea*—Rag-wort. In fields, a
troublesome weed, usually known as
the Tansy.

„ *aquaticus*—Water Rag-wort. Wet
places.

Arctium majus—Great Burdock. Generally
distributed, but rare.

Cnicus lanceolatus—Spear Plume Thistle.

„ *arvensis*—Creeping Plume Thistle.
Fields, most common variety.

Onopordon Acanthium—Scotch Thistle.

Centaurea nigra—Knap-weed.

„ *Cyanus*—Corn-flower. Corn-fields,
not very abundant.

- Lapsana communis*—Nipple-wort.
Crepis virens—Smooth Hawk's-beard.
Hieracium Pilosella—Mouse-ear Hawk-weed.
Hypochæris radicata—Cat's ear.
Leontodon hirtus—Hairy Hawk-bit.
 „ *autumnalis*—Autumnal Hawk-bit.
Taraxicum officinale—Common Dandelion.
Sonchus oleraceus—Common Sow-thistle.
 „ *arvensis*—Corn Sow-thistle.

CAMPANULACEÆ—BELL-FLOWER FAMILY.
Campanula rotundifolia—Blue-bell.

VACCINIACEÆ—CRANBERRY FAMILY.
Vaccinium Myrtillus—Bilberry.

ERICACEÆ—HEATH FAMILY.

- Calluna Erica*—Ling.
Erica Tetralix—Cross-leaved Heath.
 „ *cinerea*—Fine-leaved Heath.
Pyrola media—Winter Green. Roughilly
 Wood.

PLUMBAGINEÆ—THRIFT FAMILY.
Armeria maritima—Sea Pink.

PRIMULACEÆ—PRIMROSE FAMILY.

- Primula acaulis*—Primrose.
Trientalis Europœa—Chickweed winter-green.
 Roughilly.
Glaux maritima—Sea Milk-wort. Sea-shore.
Anagallis arvensis—Pimpernel. Fields, not
 uncommon.

GENTIANEÆ—GENTIAN FAMILY.

- Gentiana campestris*—Field Gentian. Sea-
 coast, near Boyne mouth.

BORAGINEÆ—BORAGE FAMILY.

- Symphytum officinale*—Comfrey.
Anchusa sempervirens—Near Castle ruins,
 rare, probably an escape.
Lycopsis arvensis—Small Bugloss.
Pneumaria maritima—Smooth Gromwell.
 Sea-shore near mouth of Boyne.
Myosotis palustris—Forget-me-not.
 „ *arvensis*—Field Scorpion Grass.
 „ *versicolor*—Parti-coloured Scorpion
 Grass.

- Lithospermum officinale*—Common Gromwell.
 Boyne, below Castle.

SOLANACEÆ—NIGHTSHADE FAMILY.

- Solanum Dulcamara*—Bitter-sweet. Near
 Sandend.

SCROPHULARINÆ—FIG-WORT FAMILY.

- Linaria Cymbalaria* — Mother-of-Thousands.
Walls about Portsoy.
- „ *vulgaris*—Yellow Toad-flax. Fields
near saw-mill, a garden escape.
- Scrophularia aquatica* — Water Fig-wort.
Mouth of Boyne.
- „ *nodosa* — Knotted Fig-wort.
Boyne.
- Mimulus luteus*—Yellow Mimulus. Very
abundant.
- Euphrasia officinalis*—Eyebright. Roadsides
and coast.
- Bartsia Odontites*—Red Bartsia. Roadsides.
- Pedicularis palustris* — Marsh Red-rattle.
Roughilly.
- „ *sylvatica*—Dwarf Red-rattle. Moor
near Portsoy.
- Rhinanthus Crista-galli*—Yellow-rattle. Com-
mon.
- Veronica hederæfolia*—Ivy-leaved Speedwell.
- „ *agrestis*—Field Speedwell.
- „ *arvensis*—Wall Speedwell.
- „ *serpyllifolia*—Thyme-leaved Speed-
well.
- „ *officinalis*—Common Speedwell.
- „ *Chamædrys*—Germander Speedwell.
- „ *Scutellata*—Marsh Speedwell. Ditch
near Fordyce.
- „ *Beccabunga*—Brooklime. In ditches,
common.

LENTIBULARIÆ—BUTTER-WORT FAMILY.

- Pinguicula vulgaris*—Butter-wort. Roughilly.

LABIATÆ—LABIATE FAMILY.

- Mentha hirsuta* — Hairy Mint. Bogs and
ditches.
- „ *arvensis*—Corn Mint.
- Thymus Serpyllum*—Mountain Thyme. Sea-
coast.
- Nepeta Glechoma*—Ground Ivy.
- Prunella vulgaris* — Self-heal. In waste
ground, but not common.
- Stachys sylvatica*—Wound-wort.
- „ *arvensis*—Corn Wound-wort.
- Galeopsis versicolor*—Large-flowered Hemp-
nettle.
- „ *Tetrahit*—Common Hemp-nettle.

- Lamium amplexicaule—Henbit-nettle.
 „ purpureum—Red Dead-nettle.
 „ album—White Dead-nettle.
 Ajuga reptans—Common Bugle.

PLANTAGINEÆ—PLANTAIN FAMILY.

- Plantago major—Greater Plantain.
 „ lanceolata—Rib-wort Plantain.
 „ maritima—Sea Plantain.
 „ coronopus—Buck's-horn Plantain.
 Sea-shore.

CHENOPODIACEÆ—GOOSEFOOT FAMILY.

- Chenopodium album—White Goosefoot.
 Atriplex Patula—Spreading Orache. Sea-shore.
 Salsola Kali—Prickly Salt-wort. Sea-shore, near mouth of Boyne.

POLYGONACEÆ—PERSICARIA FAMILY.

- Polygonum convolvulus—Climbing Persicaria.
 „ aviculare—Knot-gross.
 „ Persicaria—Common Persicaria.
 „ amphibium—Amphibious Persicaria.
 „ Bistorta—Snake-weed. Durn, near Portsoy.
 Rumex obtusifolius—Broad-leaved Dock.
 „ crispus—Curled Dock.
 „ Hydrolapathum—Great Water Dock.
 „ Acetosa—Sorrel.
 „ Acetosella—Sheep Sorrel.

URTICACEÆ—NETTLE FAMILY.

- Ulmus campestris—Common Elm.
 Urtica dioica—Greater Nettle.
 „ urens—Smaller Nettle.
 Parietaria officinalis—Pellitory-of-the-Wall.
 On the old Castle ruins.

EMPETRACEÆ—CROWBERRY FAMILY.

- Empetrum nigrum—Crowberry. Portsoy moor.

EUPHORBIACEÆ—SPURGE FAMILY.

- Euphorbia Helioscopia—Sun Spurge.
 „ Peplus—Petty Spurge.
 Mercurialis perennis—Dog's Mercury. Boyne.

ORCHIDEÆ—ORCHID FAMILY.

- Listera cordata—Lesser Tway-blade. Woods of Park.
 „ ovata—Tway-blade. Boyne, near Lintmill.

Spiranthes autumnalis—Lady's Tresses. Ley,
near Fordyce.

Goodyera repens—Goodyera. Roughilly wood,
but scarce.

Orchis mascula—Early Purple Orchis.

„ *latifolia*—Marsh Orchis.

„ *maculata*—Spotted Orchis.

Habenaria conopsea—Sweet-scented Orchis.
Moor near Portsoy.

„ *bifolia*—Lesser Butterfly Orchis.
Roughilly.

IRIDEE—IRIS FAMILY.

Iris Pseudacoris—Yellow Iris. Boyne.

LILIACEE—LILY FAMILY.

Allium ursinum—Garlic. Boyne.

Scilla festalis—Wild Hyacinth. Boyne.

Narthecium ossifragum—Bog Asphodel. Moor
near Portsoy.

JUNCACEE—RUSH FAMILY.

Juncus effusus—Soft Rush.

„ *conglomeratus*—Common Rush.

„ *glaucus*—Hard Rush.

„ *squarrosus*—Heath Rush.

„ *Camprocarpus*—Jointed Rush.

„ *acutiflorus*—Sharp-flowered Jointed
Rush.

Juncoides silvaticum—Great Wood Rush.

„ *compestre*—Field Wood Rush.

TYPHACEE—REED-MACE FAMILY.

Sparganium ramosum—Branched Bur-reed.

LEMNACEE—DUCK-WEED FAMILY.

Lemna minor—Lesser Duck-weed. Ditches.

NAIADACEE—POND-WEED FAMILY.

Triglochin maritimum—Sea Arrow-grass. At
Back-green, Portsoy.

Potamogeton natans—Floating Pond-weed.

„ *crispus*—Curly Pond-weed.

„ *pusillus*—Small Pond-weed.

Zostera marina—Grass-wrack.

CUPULIFERE—MAST-BEARING FAMILY.

Betula verrucosa—White Birch.

Quercus Robur—Common Oak.

Fagus sylvatica—Common Beech.

SALICINEE—WILLOW FAMILY.

Salix fragilis—Crack Willow.

Salix alba—White Willow.

Salix phylicifolia—Tea-leaved Willow.
Salix repens—Creeping Willow.
Populus alba—Poplar.

ARANCARIACEÆ—PINE FAMILY.

Pinus sylvestris—Scotch Fir.

GRAMINEÆ—GRASS FAMILY.

Phalaris arundinacea—Reed grass.
Anthoxanthum odoratum—Sweet vernal grass.
Alopecurus pratensis—Meadow Fox-tail.
 „ *geniculatus*—Marsh Fox-tail.
Phleum pratense—Meadow Cat's-tail.
Agrostis canina—Brown Bent.
 „ *palustris*—Common Agrostis.
Ammophila arundinacea—Mat grass or Murram.
Deschampsia cæspitosa—Tufted Hair grass.
Holcus lanatus—Soft grass.
Avena fatua—Wild oat.
Arrhenatherum avenaceum—Common False oat.
Cynosurus cristatus—Crested dog's-tail.
Dactylis glomerata—Cock's-foot.
Briza media—Common Quaking grass.
Poa annua—Meadow grass.
 „ *pratensis*—Smooth Meadow grass.
 „ *trivialis*—Rough Meadow grass.
Glyceria fluitans—Flote grass.
Festuca ovina—Sheep's fescue.
 „ *elatior*—Tall fescue.
 „ *arundinacea*—Sea fescue.
Bromus ramosus—Hairy bronze.
Bromus sterilis—Barren Brome.
 „ *mollis*—Soft Brome.
Lolium perenne—Perennial rye grass.
Agropyrum repens—Couch grass.
Nardus stricta—Mat grass.
Koeleria cristata—Crested hair grass.
Sisymbrium officinale—Hedge-mustard. Road-sides.
Brassica Sinapistrum—Charlock.
Draba incana—Twisted Whitlow-grass. Near Sandend.
Erophila vulgaris—Vernal Whitlow-grass. Dry banks.
Cochlearia officinalis—Scurvy grass. Muddy sea-shore.
Bursa pastoris—Shepherd's Purse.

Coronopus Ruellii—Swine's Cress. Roadsides,
but not common.

Thlaspi arvense—Penny Cress. Near Port-
soy, scarce.

Cakile maritima—Sea Rocket. Sandy sea-
shore, near Boyne mouth.

RESEDACEÆ—MIGNONETTE FAMILY.

Reseda Luteola—Dyer's Rocket. Boyne, and
near Portsoy R. S.

CISTINEÆ—ROCK ROSE FAMILY.

Helianthemum Chamæcistus—Common Rock
Rose. Cliffs at mouth of Boyne.

VIOLACEÆ—VIOLET FAMILY.

Viola palustris—Marsh Violet. Bogs.

„ *ericetorum*—Dog Violet.

„ *tricolor*—Wild Pansy. In fields,
common.

POLYGALACEÆ—MILKWORT FAMILY.

Polygala vulgaris—Common Milkwort. Com-
mon on heaths and dry pastures.

CARYOPHYLLACEÆ—PINK FAMILY.

Silene Cucubalus—Bladder Champion.

„ *maritima*—Sea Champion.

Lychnis alba—Evening Champion. Found here
and there; but rarest of all the Champions
in this district.

„ *dioica*—Red Champion.

„ *Flos-cuculi*—Ragged Robin.

„ *Githago*—Corn Cockle. Occasionally
in corn-fields east of mouth of Boyne.

Cerastium glomeratum—Mouse-ear chickweed.

„ *triviale*—Way-side Mouse-ear Chick-
weed.

Stellaria media—Chickweed.

„ *Holostea*—Satin-flower. Boyne.

„ *graminea*—Lesser Stitch-wort.

„ *uliginosa*—Bog Stitch-wort. Com-
mon in boggy places.

Arenaria serpyllifolia—Sand-wort. On sandy
bents.

„ *tenuifolia*—Fine-leaved Sand-wort.

„ *peploides*—Sea Purslane. Common
on sea-shore.

Sagina procumbens—Pearl-wort. Common
garden weed.

„ *maritima*—Sea Pearl-wort.

Spergula arvensis—Corn Spurrey.
Buda marina—Sea Spurrey. Sandy pots.

HYPERICINEÆ—ST JOHN'S-WORT FAMILY.

Hypericum perforatum—Common St John's-wort.
 „ *quadratum* — Square - stalked. In ditches.
 „ *pulchrum*—Upright. Common.
 „ *hirsutum*—Hairy. Boyne, but rare.

LINEÆ—FLAX FAMILY.

Radiola Linoides—Thyme-leaved Flax-seed.
Linum catharticum—Cathartic Flax. Common about sea-shore.

GERANIACEÆ—CRANE'S-BILL FAMILY.

Geranium pratense — Meadow Crane's - bill. Common.
 „ *sylvaticum* — Wood Crane's-bill. Near Castle ruins.
 „ *molle*—Dove's-foot Crane's-bill.
 „ *dissectum*—Jagged-leaved Crane's-bill.
 „ *Robertianum*—Herb Robert. Waysides.
Erodium cicutarium—Hem-lock Storke's-bill. Sand end.
Oxalis Acetosella — Wood-sorrel. Crannoch hill.

LEGUMINOSÆ—PEA FAMILY.

Ulex Europæus—Common Whin.
Cytisus scoparius—Broom.
Medicago minima—Little Bur-Medick. Sand-end.
Trifolium pratense—Red Clover.
 „ *medium*—Zig-zag Clover.
 „ *repens*—White or Dutch Clover.
 „ *procumbens*—Hop Trefoil.
Anthyllis Vulneraria—Lady's Fingers. Common.
Lotus corniculatus—Bird's-foot Trefoil.
 „ *uliginosus*—Greater Bird's-foot Trefoil. Boyne, but exceedingly rare.
Astragalus danicus—Purple Milk-vetch. In woods and on moors, not uncommon.
Oxytropus uralensis—Hairy Mountain Oxytropis. Sandend.

- Vicia hirsuta*—Hairy Tare.
 „ *Cracca*—Tufted Vetch. Road-sides,
 common.
 „ *Orobus*—Bitter Vetch. Near Portsoy
 R.S.
 „ *sylvatica*—Wood Vetch. Near mouth
 of Boyne.
 „ *sepium*—Bush Vetch.
 „ *sativa*—Common Tare.
Lathyrus pratensis—Meadow Vetchling.

ROSACEÆ—ROSE FAMILY.

- Prunus spinosa*—Sloe. Boyne.
 „ *domestica*—Wild Plum.
 „ *Avium*—Gean. With the preceding
 a relic of the old Castle orchard.
Spiræa Ulmaria—Meadow-sweet. In ditches,
 common.
Rubus idæus—Wild Raspberry.
 „ *fruticosus*—Bramble.
Geum urbanum—Common Avens.
 „ *rivale*—Water Avens. On banks of
 Boyne, common.
 „ *intermedium*—A hybrid between the
 two preceding, not uncommon.
Fragaria vesca—Woodstrawberry. Boyne.
Potentilla sylvestris—Common Tormentil.
 „ *Anserina*—Silver-weed. Common.
 „ *palustris*—Marsh Cinquefoil.
 Roughilly wood.
Alchemilla arvensis—Field Lady's Mantle.
 „ *vulgaris*—Lady's Mantle. Road-
 sides.
Agrimonia Eupatoria—Agrimony. Boyne.
Rosa pimpinellifolia—Burnet Rose.
 „ *canina*—Dog Rose.
Pyrus Aucuparia—Rowan tree.
 „ *Malus*—Crap Apple. Castle ruins.
Cratægus Oxyacantha—Hawthorn.

SAXIFRAGEÆ—SAXIFRAGE FAMILY.

- Saxifrage granulata*—White Meadow Saxi-
 frage. Boyne.
Chrysosplenium oppositifolium—Golden Saxi-
 frage.
Parnassia palustris—Grass of Parnassus.
 Damp sea-shore.

CRASSULACEÆ—STONECROP FAMILY.

- Sedum acre*—Biting Stonecrop.

DROSERACEÆ—SUNDEW FAMILY.

Drosera rotundifolia—Sundew. Durn Hill.

HALORAGACEÆ—MARE'S-TAIL FAMILY.

Myriophyllum verticillatum—Whorled water
Milfoil. Pond near Sandend.

„ *alternifolium*—Alternate-flowered.
Boyne.

Callitriche autumnalis—Water Star-wort.
Boyne.

„ *verna*—Spring Water Star-wort.

ONAGRARIÆÆ—WILLOW HERB FAMILY.

Epilobium hirsutum—Great Willow Herb.
Auchmore Well.

„ *parviflorum*—Small-flowered Hairy
Willow Herb.

„ *montanum*—Smooth-leaved Wil-
low Herb.

„ *palustre*—Narrow-leaved Marsh
Willow Herb.

UMBELLIFERÆ—PARSLEY FAMILY.

Hydrocotyle vulgaris—Marsh Penny-wort.
Bogs.

Conium maculatum—Hemlock. Boyndie
Churchyard.

Smyrnium Olusatrum—Alexanders. Boyne.

Carum segetum—Corn parsley. Corn field
near Birkenbog, not common.

Ægopodium Podagraria—Bishop's-weed.

Conopodium denudatum—Common pig-nut.

Myrrhis odorata—Myrrh. Banks of Boyne.

Anthriscus vulgaris—Common Beaked Parsley.

„ *sylvestris*—Wild Beaked Parsley.

Ligusticum Scoticum—Lovage. Rocky sea-
shore, not uncommon.

Angelica sylvestris—Angelica.

Heracleum Sphondylium—Cow Parsnip.

Caucalis Anthriscus—Upright Hedge Parsley.

ARALIACEÆ—IVY FAMILY.

Hedera Helix—Common Ivy.

CAPRIFOLIACEÆ—HONEYSUCKLE FAMILY.

Adoxa Moschatellina—Common Moschatel.
Hedge-row opposite Castle ruins.

Sambucus nigra—Common Elder. Introduced.

Lonicera Periclymenum—Honeysuckle. In-
troduced.

RUBIACEÆ—BEDSTRAW FAMILY.

- Galium Cruciata*—Cross-wort. Near Portsoy R.S.
 „ *verum*—Lady's Bedstraw. Common.
 „ *saxatile*—Heath Bedstraw.
 „ *palustre*—Water Bedstraw.
 „ *Aparine*—Cleavers.
Asperula Odorata—Woodruff. Where found, introduced.
Sherardia arvensis—Field Madder.

VALERIANEÆ—VALERIAN FAMILY.

- Valeriana Mikanii*—Great Wild Valerian.
 Banks of Boyne, not uncommon.

DIPSACEÆ—TEAZLE FAMILY.

- Scabiosa succisa*—Devil's-bit Scabious.

COMPOSITE—COMPOSITE FAMILY.

- Solidago Virgaurea*—Golden-rod. Boyne, below ruins.
Bellis perennis—Daisy.
Antennaria dioica—Mountain Everlasting.
 Moor near Portsoy.
Filago Germanica—Common Filago. Tillynaught.
Gnaphalium uliginosum—Cud-weed.
 „ *sylvaticum*—Wood Cudweed. Tillynaught.
Achillea Millefolium—Milfoil.
 „ *Ptarmica*—Sneeze-wort. Edges of fields, not uncommon.
Anthemis Cotula—Stinking Chamomile.
 Waste places, but not common.
Chrysanthemum segetum—Corn Marigold.
 Cultivated fields, abundant.
 „ *Leucanthemum*—Ox-eye Daisy.
 Meadows.
Matricaria inodora—Corn Feverfew. Cultivated fields.
 „ *maritima*—Sea Feverfew. Seacoast, common.
Tanacetum vulgare—Tansy. Garden escape.

The Chairman remarked that before printing in the Transactions the list which Mr Thomson had compiled, it might be well to look at the large collection which had been made by Mr Thomas Edward, one of the closest botanical observers, and

which Mr Edward had presented to Marischal College Museum.

Rev. Dr Bruce, invited by the Chairman to speak, said he thought Dr Cramond's remarks had been made in the interests of veracity and of the Club. He had frequently botanised with Mr Edward in the Boyne district, and much beyond it—up to Dufftown, Glenlivet, and Tomintoul, and he remembered quite well the large list which Mr Edward named and the dried specimens he had, which he, the speaker, had compared frequently with the lists of Professor Dickie. He could say that Mr Edward's list was very complete, and he had never found a flower yet in Banffshire which Mr Edward had not found long before. The sea flowers more especially Mr Edward knew excellently well. He thought possibly they would find from Dr Traill that Marischal College Museum had a complete list of the whole of the specimens at the present moment.

Mr Grant, solicitor, noted that Mr Thomson's list would have to be studied before its fullness or otherwise could be criticised, and this was of course seen.

A vote of thanks to Mr Thomson was heartily passed.

THE INTERSTITIAL OR CEMENTING SUBSTANCES IN THE ELGIN SANDSTONES.

Mr William Mackie, M.A., M.D., read the following paper on this subject:—

In addition to affording a ready explanation of the process by which beds of originally incoherent sand may be transmuted into masses of solid sandstone, the occurrence of cementing substances in clastic rocks raises many interesting problems regarding the former extension of rock systems over areas far beyond their present limits, as well as regarding the former existence

of formations which have long since vanished, and of which, indeed, these cementing substances now present in other rocks may be the only record. As frequently, I think, they indicate some peculiar chemical condition or state of concentration of the waters of the particular basin in which the sandstones were deposited; while from their effect on weathering they may also give rise to interesting, and, it may be, peculiar illustrations of rock sculpturing under the influence of surface agencies.

On the whole, I think the question of cementing substances in clastic rocks, and the problems they raise, have up to the present not received from geologists the attention they deserve; and the present paper may be taken as a tentative rather than a final attempt to solve some of the questions raised by the grouping of cements observed in the Elgin sandstones.

It would be advantageous, perhaps, to indicate first of all the general nature and character of these cementing substances. I shall then take up their general distribution in the Elgin sandstones, interweaving with the facts just sufficient theory to make those facts intelligible. Then some interesting examples of multiple as well as localised cements will be shortly discussed, and the succession of events of which they seem to be the records as briefly described.

From the accompanying table it will be seen that the cementing substances fall into four classes:—

- I. Hydrated Oxides of Iron=The Ferruginous Group.
- II. Salts of Lime and Magnesia=The Calcareous Group.
 - Carbonate of Lime=Calcite.
 - Sulphate „ =Gypsum.
 - Fluoride „ =Fluorspar (Cumington).
 - (Carbonate of Magnesia and Carb. of Lime=Dolomite).
 - Sulphate of Barium=Barytes (Covesea).
- III. Quartz=Siliceous Cement.
 - (Glaucinite=Ferro-Siliceous) (Ashgrove and Lossiemouth Oolite).
- IV. Hydrated Silicate of Alumina, &c.=Felspathic Cement.

In the Lower Old Red rocks the predominating and most widely distributed cement is, of course, ferric hydroxide. But locally, in addition to the ferric hydroxide, it is all but co-extensive with the Lower Old Red rocks, and it has never, so far as I know, been doubted that it has been deposited on the grains contemporaneously with the deposition of the beds themselves. Its presence must, therefore, point to some condition of the waters of the L.O.R. lake in which they were deposited. The ferruginous, in the form of ferric hydroxide, there occur enormous quantities of carbonate of lime, reaching to as much as 30 per cent. of the entire rock in some of the analyses of L.O.R. sandstone I have made. It is difficult to believe that such quantities of carbonate of lime could have been deposited otherwise than contemporaneously, and in some cases, as for instance over the Orcadian area—with which, however, we are not at present concerned—there is every probability that it was so deposited. But the particularly local distribution of the calcite cement in the Elgin area may, I think, be taken as indicating a different origin. Apart from the case of the Orcadian Old Red, which we have just discounted, the occurrence of calcite is limited to an area in the east of Morayshire and the adjoining parts of Banffshire.

The L.O.R. rocks from the Lossie at Birnie eastwards along Glen Rothes, the slopes of the Brown Muir, and Findlay Seat, in the beds which crop out along both sides of the Spey, along to Tynet, Portgordon, and Buckie, the Old Red rocks are strongly charged with carbonate of lime. To the west the quantity present is either small or it is entirely absent. At Piperhill in Nairnshire occurs the only instance I know of at present of a L.O.R. rock showing rims of secondary quartz around its constituent grains. In the L.O.R. of Inverness-shire, around Foyers, for instance, carbonate of lime is either absent or occurs in very small quantity. The mass of red rocks on the opposite shore of Loch Ness, which pass under the conglomerates of Meal Fourvounie, and which probably for that reason are among the earliest manifestations of the L.O.R. in the north of Scotland, show no calcite in their composition. Further north, at Tara-

dale, I have a record of 6.34 per cent. of carbonate of lime—a quantity not so phenomenally large as to require any particular explanation. In this connection it may also be stated that in some of the larger outliers of the L.O.R. in Aberdeenshire there is practical absence of carbonate of lime.

To pass to the Upper Old Red rocks, it may be remarked that in the beds which immediately succeed the L.O.R. in the Elgin area, the ferruginous cement is widely distributed, and here also the quantity of calcite may be simply phenomenal as at Scaat Craig, where, according to one analysis, it reached 42.45 per cent. It is also present in large quantity at Milton Bræ, to the south-west of Elgin, where the sandstone, from its fossil contents as well as the beautiful rounding of its constituent grains—a condition never yet observed in undoubted L.O.R. rocks—has been shown to belong to the U.O.R. division, and to be of the same age as Scaat Craig. In the rocks on the Findhorn, and again around Nairn, considerable quantities of calcite occur. I note Kingsteps 6.25 per cent., Delnies 13.6 per cent. Higher in the series comes a bed of rough limestone, seen in section near Elgin, and again at Cothall on the Findhorn. Its presence may be taken as indicating that the waters of the U.O.R. lake eventually became surcharged with carbonate of lime; and the occurrence of the enormous quantities of carbonate of lime in the earlier beds of the series would appear to suggest either premonitions of the onset of these conditions during the period in which they were themselves deposited, or that the limestone bed, by perfiltration at a period subsequent to its deposition, became the source of the carbonate of lime present in the underlying beds. The waters of the U.O.R. lake may have extended more widely; and, as a matter of fact, we know that they did extend more widely than the present out crop of the limestone beds would indicate, and by implication the limestone beds themselves must have extended more widely than they do now, and in their former extension over the area now occupied by the lower beds of the U.O.R., as well as the adjoining beds of the L.O.R., would ample explanation of the presence

of carbonate of lime in these local beds of the U.O.R. and the L.O.R. be found.

On the negative side this contention is borne out by the practical absence of carbonate of lime from the sandstones of the U.O.R. which overlie the limestone beds. At Newton the occurrence of carbonate of lime in some of the beds, and its entire absence in others, may be taken as indicating its contemporaneous deposition in the beds in which it does occur.

In the upper divisions of the U.O.R. we have the first indication of a wide-spread infiltration of secondary quartz. It is absent at Newton, but present in sandstones of like facies in the Millstone, Cardenhill, and Sweethillock quarries further to the west. In the latter two it is typical, and surrounds the grains in relatively broad bands, which almost completely fill up the interstices between the grains of what are really very rough sandstones. At these three localities, as well as at Newton, there is another peculiarity. The surfaces of the grains of sand are covered with large numbers of minute oblong crystals.

In the first three they have been subsequently overlaid with secondary quartz, but at Newton the quartz is absent. These minute crystals I at first considered to be—and I believe recorded as—sulphate of lime. From their extreme minuteness it is of course impossible to decide with certainty. But several considerations make it probable that they are sulphate of barium:—(1) They are too insoluble to be sulphate of calcium; (2) they are never seen to be twinned; and (3) I have been able to separate a trace of barium from some specimens of Newton sandstone. In this connection, and for another reason to be stated afterwards, special interest attaches to the occurrence of sulphate of barium, green fluor-spar, and a sulphide of iron as vein-stones in this quarry. I exhibit a specimen showing all three together. Celestine, that is sulphate of strontium, is stated by Heddle in his "Mineralogy of Scotland," on the authority of Greg, to occur in sandstone near Elgin, marked doubtfully Newton quarry.

In the uppermost or Rosebrae division of the U.O.R. rocks carbonate of lime is now entirely

absent; but as we shall see there is reason for believing that that or some other relatively soluble cement was originally present in isolated patches in these sandstones, just as it occurs now at Spynie in rocks of Reptiliferous age. The cement of the Rosebrae division is siliceous, but the quartz rims are not continuous, except at Laverock Loch, somewhat farther north. The secondary quartz comes on outside the scanty coating of ferric hydroxide. In a quarry of brick-red sandstone by the roadside to the south of Findrassie, and in beds of very similar facies exposed along the shore westwards from Stotfield and on Stotfield links, and understood to be of U.O.R. age, the grains have first been deeply covered with ferric hydroxide, and then completely sheathed in secondary quartz.

At Bishopmill, where the cement is mainly ferruginous, with some slight indications of secondary quartz, a colourless anisotropic cement substance has been seen in irregular fragments in a number of specimens that have been examined. A sulphate has been detected, but up to the present no barium. Calcium is always present in sufficient quantity to unite with all the sulphuric acid present. Barium sulphate, however occurs as a veinstone in this quarry also.

In the Reptiliferous generally the cementing substance is quartz, secondary in some cases to ferric hydroxide, which, as we shall presently see, there is remarkable evidence to show is itself secondary in point of time to the deposition of the sandstones. In the wind-accumulated deposits of Cutleshillock the quartz is in the form of discontinuous points, except along one linear band, where it is continuous. At Quarrywood there is little or no secondary quartz, and the cement is ferruginous, probably with the addition of some felspathic. And in this connection, it may be interesting to state that pockets of an almost chemically pure kaolin, evidently of secondary origin, are to be found in the sandstones of this quarry. An analysis of a typical sample is subjoined in the appendix.

In the Spynie rock, which is the hardest and most durable of the local sandstones, the secondary quartz occurs in broad rims which inter-

lock very closely, so that a microscopic section seems to show the original grains embedded in a clear continuous paste. Here there has also been deposited at separate points throughout the body of the rock crystalline carbonate of lime, and where the carbonate is present the quartz rims are absent. The evidence is, therefore, complete that the carbonate of lime was deposited before the secondary quartz. Towards the periphery of these carbonate of lime areas, a thin quartz rim may, however, occasionally be seen to come between the grains and the carbonate of lime. This would indicate that the calcite areas continued to be added to after the deposition of the quartz had commenced.

It is very interesting to note that secondary quartz is a feature of all the rocks belonging to this period. It is least developed at Findrassie, but even there it is not altogether absent. In the sandstones of the coast range, which extends from Covesea to Burghead, there has been a previous infiltration of ferric hydroxide, which, as we shall see, has itself been deposited at a period subsequent to the deposition of the sandstones themselves. The hydroxide has been followed by the quartz, and this again by another period of infiltration of ferric hydroxide.

For the sake of completeness it may be noted that secondary quartz is also a feature in the small patch of greenish sandstone of Middle Oolite age, faulted against the Reptiliferous at Lossiemouth. The component grains are here decidedly angular, and the green colour is evidently due to large numbers of small, dark, yellowish-green, highly refracting crystals, which I somewhat doubtfully refer to glauconite. The occurrence of secondary quartz in this sandstone, if it is to be presumed that the infiltration of quartz in the Elgin sandstone is all to be ascribed to one period—and there is no reason I know of for taking a different view—would decisively fix it down to a date posterior to the Middle Oolite.

So far we have had to do with general cementing substances extending continuously over wide areas; but, perhaps, some of the most interesting features of cements fall to be considered in connection with the localised cements, or the substances which have been laid down in discrete

areas, sometimes it may be through extensive masses of sandstone. A peculiarity of these localised cements, which so far as my observation has yet gone holds throughout the Elgin sandstones, is that in the nuclei of all these discretely cemented areas, the cementing substance has uniformly been deposited directly on the sand grains and by implication antecedent in time to the continuous or generalised cements. Thus in the Reptiliferous of Covesea, and extending westward from the Lighthouse for about a mile to just under the cottages at Old Covesea, the sandstone shows innumerable nodules, which are found on examination to be impregnated with sulphate of barium. Within the tideway these nodules, in consequence of their being more resistant than the general body of the sandstone, stand out in rounded knobs over the rock surfaces; whereas on the high cliffs, where the denudation has latterly been purely subaerial, the nodules, by some process of peripheral weathering towards the explanation of which I have as yet no clue, eventually tumble out, the cavities from which they have fallen being subsequently much amplified, and thus leave the peculiar fretted or pock-pitted appearance which is well shown in the photograph of a cliff near Covesea Lighthouse which I exhibit.

To the naked eye a section of one of these nodules shows, first, a central glistening white surface; then a dark purplish ring, deeper at some points than others, and consisting, as it turns out, to be of a sulphide of iron. This dark ring is followed towards the periphery by an irregular white ring, and that again by an irregular reddish brown ring of ferric hydroxide, while outside this again comes finally an irregular wavy border of glistening white.

Under the microscope in the central white area the sulphate of barium—for it is that which gives the glistening white appearance—is seen to directly envelope the grains of sand. Then the purple band seen under the microscope as blotches of sooty black directly envelopes the grains, the barium sulphate coming on outside the dark masses. In the middle white ring the sulphate again directly surrounds the grains; then the ferric hydroxide comes on, and has

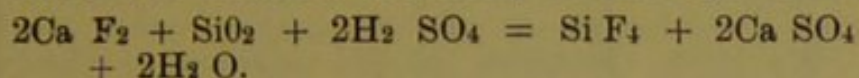
been deposited directly on the grains, the sulphate of barium being again outside the hydroxide, and, finally, in the outer glistening border the quartz may be seen to come in above the ferric hydroxide, the barium sulphate in this area mostly coming on outside the ferric hydroxide and the quartz rims. Lastly, where the infiltration ceases, we have a coating of ferric hydroxide outside the secondary quartz, but entire cessation of the deposit of barium sulphate.

The interpretation of these facts is not, I think, far to seek. The barium sulphate in the nucleus of the nodule has been deposited first, and it may be presumed shortly after, if not almost contemporaneously with, the deposition of the sandstone. It has been added to in succeeding periods, during which there was infiltration of ferric sulphide, ferric hydroxide, quartz, and again ferric hydroxide, but a process well known in crystallisation, that is to say, the slow deposition on crystal surfaces of fresh substances of the same kind from a solution in which the crystals are immersed. In fact, in these nodules the barium sulphate may be slowly extending its boundaries by this process even now; and when one remembers that the solubility of barium sulphate is only about 1 in 400,000, one may form a rough idea of how long it has taken such a nodule to grow.

The occurrence of barium sulphate in quantity in sandstones is not a fact altogether new to science. Emeritus Professor Clowes, of Nottingham, as long ago as 1885, and again as recently as 1899, has described deposits of barium sulphate in upper Triassic rocks near that city: and the presence of the same substance in rocks of the same age in a distant and presumably isolated area of deposit becomes for that reason doubly interesting.

But another substance which has not been described as occurring in the Trias of England is to be found fairly widely distributed through sandstones of the same age some miles further west at Cumingston. I show you a smooth surface of a piece of sandstone from the quarry near that village. It exhibits a large number of glistening white patches, many of them as you will see showing a roughly square outline. The

substance that has crystallised in these patches is calcium fluoride or fluorspar. As it is the first time, so far as I am aware, that this substance has been described as occurring widely disseminated through the body of a sandstone, a short account of the circumstances of its discovery may not be out of place. As long ago as 1894 I was struck with the number of irregular, colourless, isotropic fragments that occurred among the sand grains of this quarry, when these were examined in polarized light. I find in a paper written in the beginning of that year that they are put down as "colourless garnets"; still they had manifestly a refractive index much too low for garnet. In the following year fluorine in quantity was discovered in these sandstones by the application of a test well known to chemists, which consists in heating the dry and powdered sandstone with strong sulphuric acid in a dry flask, and passing the evolved gas through a perfectly dry tube into water, when a copious precipitate of gelatinous silica was obtained according to the equations:



The Silicon Tetrafluoride on coming in contact with water giving $3\text{Si F}_4 + 2\text{H}_2 \text{O} = 2\text{H}_2 \text{Si F}_6 + \text{Si O}_2$.

An analysis of an average specimen of this sandstone appears in the appendix.

In the centre of these nodules the fluoride is deposited directly on the grains of sand. In many this arrangement holds throughout. In others again towards the periphery ferric oxide and quartz rims occasionally come between the fluoride, and the grain showing again that the fluoride has been added to during subsequent geological periods. Outside these areas the sandstone shows ferric hydroxide overlaid by continuous quartz rims, and a coating of hydroxide again comes on outside the quartz. Around many of these fluoride areas a dense layer of ferric hydroxide has been laid down, showing unmistakeably that the wave of inflowing hydroxide has been subsequent to the deposition of the bulk of the fluoride. But altogether, apart from the evidence revealed by the microscopic, there is abundant evidence in the arrangement

of the ferric hydroxide in circinate or even concentric lines to show that it must have been deposited at a period long subsequent to the deposition of the sandstone.

The sequence of events, geologically speaking, is here manifestly the same as obtains at Covesea in the case of the barium sulphate nodules, and the same, or at least a similar explanation, is therefore indicated. First of all, two, if not three, important facts are to be noted regarding these two interesting substances, barium sulphate and calcium fluoride. In the first place, in the nuclei of these nodules they have both of them been deposited directly on the sand grains. They must, therefore, have been deposited at a very early period, if not actually contemporaneously with the sandstones. In the second place, they are very insoluble substances; and, in the third place, they are both present in sea water, and would naturally be expected to be present in relatively large quantities in any large body of water that had undergone concentration by evaporation, and also to be the first to crystallise out of these waters as evaporation went on.

We have, therefore, in the presence of these substances in the sandstones, I think, indicated important evidence regarding the geographical conditions of the time. An inland sea or lake, the waters of which were being gradually concentrated under what have aptly been called "desert conditions," would fully meet the circumstances of the case. In such a lake the more insoluble substances in its waters, such as barium sulphate and calcium fluoride, would be the first to crystallise out, and in consequence would be deposited among and around the grains of sand under its waters. Then, as evaporation went on, in the order of their insolubility would come all the other salts dissolved in its waters, till finally sodium chloride—common salt in solid form—would be thrown down. As far as I can make out, the barium sulphate around Nottingham occurs in beds which are elsewhere associated with the presence of sodium chloride; but I am not aware that a similar explanation has been offered in their case. Only a little stretch of imagination is necessary to extend the deposition of salt to the Covesea area, and

to bring on salt beds immediately above the rocks of the coast range; but, if ever they did occur in that position, they have long since vanished under the denuding agencies of later times. So must also have the beds from which the ferric hydroxide and the secondary quartz, now seen as cement in these sandstones, were no doubt derived. The occurrence of the same substances as we find in the sandstone of the coast—viz., barium sulphate, calcium sulphate, calcium fluoride, sulphide of iron, whether distributed through the mass of the sandstones or existing as vein stones in the neighbouring older U.O.R. rocks, probably mark the extension of the Triassic lake over the adjoining U.O.R. area, and the derivation by perfiltration from its waters, or subsequently from the rocks deposited in them of what are identically the very same substances as we find in the Reptiliferous rocks themselves.

Before concluding this paper, I should like to refer to some peculiarities of weathering in some of the sandstones which are referable to the presence of these cementing substances. The peculiarity of the barium sulphate nodules in this respect has already been referred to. In the case of the calcium fluoride nodules there occurs what might be called a negative variation in the form of white spots in the sandstone, similar in every respect to the others, but in which no fluoride is now found. It would appear that it had been originally deposited in these areas, but at an intervening period only to be broadly fixed as posterior in date to the deposition of the ferric hydroxide and secondary quartz, it had been re-dissolved and carried away, thus leaving the areas in which it was originally present without any cement whatever. Exposed to the atmospheric agencies, the sand grains in these areas tumble out, and exhibit a pitted surface of the sandstone as the result.

This is by no means the only instance where such negative areas occur. The same sort of pitting on weathered surfaces of Rosebrae sandstone have been observed; and I was surprised to find them on recently quarried blocks from a quarry towards the eastern end of the same ridge in a sandstone, which, as it occurs above

the pebble band—here said to be double—may be taken to be of Reptiliferous age. I have already said that those sandstones are cemented by discrete points of secondary quartz. Granting now that there had been, as, indeed, actually obtains in the neighbouring quarry at Spynie, a previous deposit in discrete spots of carbonate of lime—or for that matter any other relatively soluble cements—which would necessarily prevent the deposit of secondary quartz at these points, and that the carbonate of lime or other hypothetical cement had been subsequently removed, one can easily see how these original areas would thus be left without cement, and thus give rise on exposure to the appearances observed. We have some reason, therefore, for thinking that even in the Rosebrae division of the U.O.R., just as in the other rocks of that age, there was once carbonate of lime, that it has vanished, and given rise to the appearances we see.

I shall refer to only one other curiosity. At Kingsteps quarry there is a vein of copper ore. I have been able to determine from samples supplied me by Mr Taylor, Lhanbryde, that the original ore is the indigo sulphide CuS , known by the name of Covellite. The vein is bordered on each side by a band impregnated by green malachite, as shown by the subjoined analysis. The peculiarity is that carbonate of lime, which is universal in its occurrence in these sandstones, does not appear within the limits of the vein. Beyond the limits of the vein, however, the carbonate of lime is associated with malachite. The specimen I submit, which was evidently taken from some distance from the vein, contains over 5.5 per cent. of malachite, the presence of which may be readily demonstrated by pouring some ammonia on some of the powdered sandstone, when the supernatant liquid becomes deep blue from solution of the malachite in the ammonia.

In conclusion, I would beg to state that the foregoing theories are not to be accepted as by any means final. I simply state them as conveying to my mind the best and most probable interpretation of the facts that has occurred to me after thinking over those facts from time to time for several years.

APPENDIX.

1. Analysis of soft white substance occurring in pockets of the Sandstone in the quarry at Quarrywood.	2. Nodules in Reptiliferous Sandstone, Covesea, chiefly centres.
Silica, 44·99	Silica, 61·61
Alumina and trace of Ferric Oxide, 34·79	Alumina, 2·60
Lime, 2·32	Ferric Oxide, '05
Magnesia, '13	Sulphide of Iron, '69
Potash, 1·23	Lime, '15
Soda, '69	Magnesia, .. trace
Chlorine, '12	Potash, '50
Water of Constitution, 13·90	Barium Sulphate, 32·42
Moisture, 1·03	Calcium 1·07
Insoluble Residue, '57	Soda, trace
	Loss on ignition, '91
99·77	100·04

3. Nodules in Covesea Sandstone, chiefly from purple areas.

Silica, 53·83
Alumina and Ferric Oxide, 5·51
Barium Sulphate, 36·82
Calcium 1·67
Sulphide of Iron, 1·38
Lime, '25
Alkalies, not estimated
And loss (by dif.), '54

100

4. Average Sample of Cumingston Sandstone containing Fluoride of Calcium.

Silica (by dif.), .. 69·39 %	The Fluorine was estimated by Fresenius' absorption method, as well as by precipitation as Calcium Fluoride — the results being practically identical.
Alumina and Ferric Oxide, .. 1·99	
Calcium Fluoride, 25·88	
Lime, '91	
Magnesia, .. trace	
Potash, '34	
Soda, '25	
Loss on ignition, 1·24	

100

5. Nairnshire Copper Ore.

(a) Centre of Veins.	(b) Margin of Veins.
Sand and Silica, .. 58·54 52·35
Copper, 25·97	Copper Oxide, 32·40
Sulphur, 11·65 1·46
Alumina and Ferric Oxide, '46 '48
Lime, trace '36
Carbonic Acid, .. 1·11 7·73
Water, &c., 1·85	.. Not estimated

Results show that Copper exists at the centre mainly as Copper Sulphide (CuS = Covellite, which is a mineral new to Scotland), and as Malachite at the margins.

The interest of the paper was much enhanced by diagrams and numerous geological specimens which were handed round among the company.

Mr Wallace, Inverness, spoke of the originality of the paper, and said this was not the first time Dr Mackie had ably dealt with the Elgin Sandstone, and they found him now embarking on a new phase in the study of sand ~~veins~~. He proposed a vote of thanks to Dr Mackie for his valuable contribution, and the motion was cordially carried.

Gordon

GORDON CASTLE AND THE DUCAL FAMILY.

Dr Cramond afterwards gave some particulars of special interest in view of the excursion of the following day. He said—The castle, though situated on a plain, commands an extensive view. As you approach, the eye is arrested by the massive quadrangular tower of six storeys, rising to the height of nearly ninety feet. This tower was built by George, second Earl of Huntly, and thus has weathered the northern blast for more than four centuries. The Bog o' Gight, or the "Windy Bog," was the name it bore till the title of Duke of Gordon was conferred on George, Marquis of Huntly, in 1684, when it began to be designated Gordon Castle. It was almost entirely rebuilt by Alexander, the fourth Duke, towards the close of last century. As it now stands, the main building adjoins the tower, and consists of four storeys, while spacious wings extend to the east and west, having galleries or arcades to connect with the main building, and forming altogether an imposing frontage of 568 feet, constructed throughout of Elgin freestone, and the walls surmounted by battlements.

Plots of grass and flowers, shrubberies, and trimly-kept walks extend far in front of the Castle, and adjacent lies the great park—a level expanse of ten or twelve square miles, containing some of the finest trees in the North of Scotland, especially limes and sycamores. In

an ample enclosure roams a large herd of fallow deer. This herd has been one of the attractions of Gordon Castle for more than a century. The amenity of the Castle was much improved about a hundred years ago by the removal of the town and church of Fochabers to their present site. The old Town Cross still remains where it originally stood, and attached to it are the iron jugs by which offenders were fastened to the cross by the neck. The interior of the Castle is sumptuously furnished and adorned with paintings and statuary and innumerable deers' heads.

George, fifth Duke of Gordon, having died in 1836 without issue, the Marquisate of Huntly devolved on his cousin. The eldest sister of the last Duke of Gordon married the Duke of Richmond, who succeeded as heir of entail to most of the property. The present Duke of Richmond succeeded in 1860, and was created Duke of Gordon in 1876.

The history of the North of Scotland for the last four centuries is intimately associated with the House of Gordon. Mrs Grant of Laggan gives expression to a feeling that must often have found utterance in the home of the head of the Gordons:—

“ Oh, where, tell me where, is your Highland laddie gone?”

“ He's gone with streaming banners where noble deeds are done,

And my sad heart will tremble till he comes safely home.”

The allusion in the song is to the Marquis of Huntly when he went to Holland, under Sir Ralph Abercromby, in 1799, as Colonel of the 92nd, or Gordon Highlanders; but the war-cry never reached the ears of the Gordons in vain. The first of the line, Lord Gordon, was in the “bloody Harlaw,” and figured afterwards in the wars with France; the second Earl of Huntly was Lieutenant of the northern parts of Scotland—no sinecure post in the fifteenth century; the third Earl was in command at Flodden, and was afterwards Lieutenant of all Scotland; the fourth Earl fought at Pinkie and fell at Corrichie, while his son was beheaded at Aberdeen, Queen Mary witnessing his execution with many tears; the sixth Earl (the first Marquis) gained the Battle of Glenlivet; the second Marquis fought for the King, and was beheaded at Edinburgh, and his son was slain at

the Battle of Alford. The second Duke proclaimed the Chevalier as King at Gordon Castle, and joined the rebels with two thousand men. The fourth Duke raised the 89th Foot on his estates, and the fifth Duke raised the 92nd, or Gordon Highlanders. The present Duke, too, has martial instincts, for he was formerly an officer in the Horse Guards.

Hospitality has ever been a conspicuous feature of Gordon Castle. "The Gudeman o' the Bog" was in ancient days the Highlanders' affectionate mode of designating their chief. "The Cock e' the North" expressed in later times the lordly power of the house of Gordon. The present Duke of Richmond and Gordon is a model landlord and is beloved by his numerous tenantry.

We are walking in the footsteps of distinguished men when we go to Gordon Castle. Taylor, the water poet, was here entertained in the 17th century by the Marquis of Huntly, where, says he, our entertainer was like himself—free, bountiful, and honourable. Boswell, in his *Life of Johnson*, says, under the year 1773, "We passed Gordon Castle, which has a princely appearance." Burns was here with his companion Nicol in 1787. In speaking of Gordon Castle, it should be noticed that Elezer in his *Theatrum Scotiae* has mis-named some of his plates. His "Castle of Inverero" may represent Gordon Castle in 1693, but his plate entitled "Boghengieght" is not Bog o' Gicht but Heriot's Hospital, Edinburgh.

We often read of the "Boat of Brig" in old papers. This was near Fochabers where about a century ago the ferry boat was replaced by a bridge, which was swept away by the flood of 1829. A fine stone bridge said to have cost £13,000 now takes its place.

Shaw says the original of Gordon Castle was a gloomy tower in the centre of a morass called the Bog o' Gicht, accessible only by a narrow causeway and a drawbridge. The tower he says was formed by George Earl of Huntly, who died in 1507.

The Quarry Gardens form one of the most interesting features within the policies. Here are interesting ferns and flowers and old carved stones, said to have been brought from Huntly Castle. Here are the initials and monogram of the 1st Marquis and Marchioness of Huntly. Two texts bear the date 1614.

At the Castle we shall see the section of a tree cut in the forest of Glenmore, six feet broad, bearing a brass plate thus inscribed—"In 1783, Wm. Osborne, Hull, purchased the forest of Glenmore from the Duke of Gordon. He cut it down in 22 years, and built at the mouth of the Spey 47 sail, one of them was in the service of His Majesty." Date of presentation, 26th September 1806. We cannot be in that neighbourhood without remembering that the eldest son of the great Montrose, Lord Graham, a youth of 15, was buried in the old church of Bellie. "He takis seiknes," says Spalding, "dies in the Bog in a few dayis, and is bureit in the Kirk of Bellie, to his fathir's gryt greif." This was in March 1645. Huntly Castle, the other principal family residence, ceased to be inhabited c. 1760.

The writer of the Old Statistical Account, a little over a century ago, says—"The town of Fochabers has been removed from the vicinity of Gordon Castle to a rising ground nearly a mile distant. Gordon Castle is well known," he adds, "to be one of the noblest palaces in Britain, and attracts the notice of all travellers, who never fail to return highly gratified."

On the motion of Mr Wallace, a vote of thanks was passed to Dr Cramond, both for his excellent papers and for his conduct in the chair.

SUPPER IN FIFE ARMS.

At half-past eight, the members met in the Fife Arms Hotel at supper, when an excellent repast was served under the superintendence of Mr Chisholm. Dr Cramond presided, and Mr Wallace, Inverness, was croupier. There were also present—Dr Mackie, Elgin; Mr J. A. M'Gruther, Inverness; Mr James Morrison, solicitor, Banff; Mr P. R. Harper, Earhill; Mr James Forbes, solicitor, Banff; Bailie Alexander, Banff; Mr John W. Simpson, Banff; Mr James Mair, schoolmaster, Banff; Mr James Grant, solicitor, Banff; Mr John Yeats, Banff; Mr A. Greig, Sandlaw; Provost Munro, Banff; Mr William Rhind, London; Mr Jaffrey and Mr Crawford, Hopeman; Mr James Fraser, Inverness; Mr William Wilson, Terpersie, Alford; Mr J. Tennant Gordon, chief constable; and Mr William Barclay, Duncan Street, Banff.

The Chairman gave the usual loyal toasts.

Mr James Morrison gave the toast of the Imperial Forces, and Captain Grant, of the Macduff Company of Volunteer Artillery, responded.

The Chairman then gave the toast of the Association, remarking that no one could take up its Transactions for a number of years back without being struck with the great amount of valuable and reliable information that was to be found there. Heaven and earth seemed to have been ransacked in order to clear up dubious points and to settle controversies on all manner of subjects. (Cheers.) He was delighted to see some of the Societies displaying such an amount of vitality and vigour. One sometimes thought, especially those of them who had been for a long time connected with Societies such as those of Banff and Inverness, that the time would perhaps come that they would have to deplore the fact that they had no more worlds to conquer, but that time had scarcely arrived yet. (Cheers.) With the hope that the Association would go on and prosper, he would couple the toast with one of the most respected and oldest members they had in connection with the affiliated Societies—their dear friend Mr Wallace. (Cheers.)

Mr Wallace, in responding, said some fifty years ago the society which went under the name of the Northern Association was in full force. That was a very old Association, and its members were drawn from the landed proprietors and country gentlemen of the North at that time. Inverness was its headquarters, and under its auspices a very excellent museum and collection of objects of geological and archæological interest was brought together. That collection, unfortunately, had been scattered, he might say, to the four winds. It was at one time located in the Inverness Royal Academy—the old building, and from that it was removed from one place to another until the institution of the Inverness Field Club, when he, with several others, unearthed it in the old Town Hall, in a very dilapidated condition. Some twenty-five years ago Field Clubs became fashionable institutions. Banff, he thought, was among the first, and they had clubs also in Huntly, Nairn, Elgin, Inverness, and Dingwall, all doing excellent work. It was now about 21 years ago that at a meeting of the Inverness Scientific Society he proposed that there should be a joint meeting in Elgin, and from that time to this they had gone on having joint meetings under the old name, which they revived at the time, of the Northern Association of Literary and Scientific Societies. Of the Societies existing then, Banff, Nairn, Elgin, and Inverness continued to exist, but there were signs also of new vigour. This last year in Inverness they had one of the most successful sessions they had for many years, and new Societies had sprung up in Dingwall and Morayshire. The latter was in connection with the Teachers' Association, and now that Nature Knowledge had to be taught in the day schools, it was

almost imperative that teachers should know something of the district in which they were situated. Mr Wallace concluded by expressing his pleasure at coming to Banff.

Mr Crawford, Hopeman, in proposing the Town and Trade of Banff, alluded to the Biggar Memorial Fountain in the town, erected in memory of the man who had inaugurated on a large scale trade in herrings between Scotland and the Continent, and said that on that account alone the whole Moray Firth owed a debt of gratitude to the town, for nothing had been more prosperous during the last fifty years than the fish trade with the Continent. Mr Crawford spoke also on the educational fame of the county, remarking that Banffshire was recognised as a centre of education throughout Scotland, and he did not know any county in Scotland that had produced more able men than it. (Hear, hear.)

Provost Munro, who replied, praised the sanitary condition of the town, its beautiful surroundings, and remarked that the people seemed to be comfortable and contented with the business they had.

Treasurer Forbes gave the toast of the Ladies, on whose behalf Mr Yeats made a gallant reply.

Bailie Alexander proposed one of the youngest of the affiliated Societies—the Morayshire Teachers' Field Club, and Mr Crawford, Hopeman, in replying, gave some information as to its inception and aims.

A number of songs were excellently sung during the evening, and a happy few hours ended by the company honouring with heartiness a toast to the health of the chairman.

THE EXCURSION.

The excursion took place on Saturday. Soon after ten o'clock in the morning the party assembled in the Public Square, Buckie. Among those who joined in the excursion were Provost Munro, Banff; Mr Yeats, Banff; Mr John and Miss Simpson, Banff; Mr Grant, LL.B., solicitor, Banff; Mr George Thomson, M.A., Banff; Mr W. Wilson, Terpersie, Alford; Mr Mair, rector, Banff; Mr J. Tennant Gordon, Banff; Mr Forbes, Macduff; Dr Mackie, Elgin; Dr Cramond, Cullen; Mr Wallace, F.R.G.S., Inverness; Mr Fraser, Inverness; Mr M'Gruther, Inverness; Mr John Macdonald, solicitor, Buckie; Miss Wallace, Elgin; Mr Fowlie, Cullen House; Mr Crawford, Hopeman; Mr George Thomson, Gollachy, &c. The party started in brakes from the Commercial Hotel, and made their first halting place at the mouth of the Gollachy burn. Walking up the burn side, the botanists of the

party found an unusual variety of flowers, and all halted when they arrived at Mr John Dawson's tweed manufactory. They inspected with much interest, under Mr Dawson's guidance, his hand and power looms, and admired his beautiful productions of tartans, blankets, &c. All were surprised to find such excellent work done in such an unlikely spot. Hammer in hand Mr Wallace gave a lucid exposition of the geological characters of the Gollachy burn. Here, he showed, was to be seen an example of igneous action in old red sandstone time, this being one of three such examples. One of the others is near Huntly, and the third in the Black Isle. The porphyrite is overlaid by strata composed almost entirely of rolled pebbles of its own composition, with a few pebbles of quartzite. At one part of the burn the lava flow has come in contact with the fossil bed, and very much altered the fish remains which are peculiar to the old red of this district.

Continuing their walk, the company arrived at Mr Thomson's farm of Gollachy, where they inspected with much pleasure his rich collection of archæological and scientific objects his excellent specimens of fossils from the neighbouring Tynet Burn coming in for a large share of attention. In Mr Thomson's museum is a herbarium of beautifully mounted specimens, also flint arrow heads, axes and hammers, some of them very fine, mustard and pepper mills, a very old battle club found in Spey, a gun of the Rathven Volunteers of a century ago, a fine Andrea Ferrara, a watch, and a silver-mounted pistol that belonged to the Duke of Gordon, a spinning contrivance that belonged to a sister of a former Earl of Fife, an extinct ant-eater from Trinidad, and curiosities from all parts of the globe. Before leaving Gollachy, the company was hospitably entertained by Mr Thomson.

Time prevented a close examination of the Tynet burn, but Mr Thomson explained the nature of the beds. There is first eight feet of soft yellowish shale, then seven feet of red clay, next three feet of sandstone rock, over which there is a thin covering of plastic clay wherein are found numbers of nodules, but few fossil remains. This last is known as the dummy bed.

Under this three feet of rock is the second fish bed, wherein are nodules with well-preserved specimens of the *Cheiraceinthus*, the *Diplacanthus*, and *Pterichthys*. Next after removing another layer of rock a mass of brecciated flag is reached, and under this mass is the osteolepis bed, in which are also to be found the *Cheirolepis*, the *Dipterus*, &c. After crossing the Tynet burn, the party drove in a northerly direction to examine some erratic boulders. Mr Wallace showed that one immense boulder must have travelled from Kinsteary, near Nairn, and another close at hand from Stratherrick, near Foyers. The stone circle at Dryburn next claimed attention and examination. Then came the Green Cairn, a description of which occurs in Chalmers' *Caledonia*, furnished by James Hay, of Green Castle, in 1798. The sepulchral remains included an urn and a gold ornament like the top of a vase, sold to a jeweller for thirteen guineas, and melted down.

After this a delightful drive through the woods brought the party to the Quarry Gardens, which were much admired. Here the brakes made for Fochabers, and the party walked to Gordon Castle, admission to which by favour of the Duke of Richmond and Gordon had been arranged for by Mr Muirhead, His Grace's commissioner. The spacious rooms with their artistic treasures, including pictures of the Dukes and Duchesses of Gordon, and others, by Vandyke, Raeburn, &c., were greatly admired, also the armoury, with specimens of chain mail, Highland targes, and weapons of every variety. The immense collection of deers' heads and the specimens of Tynet fossils proved also very attractive. Mr Muirhead now took the party in charge, and conducted them over the grounds to the site of the old town of Fochabers, where the cross and joughs are still to be seen. In the beauty of a charming day, such as Saturday was, nothing could exceed the loveliness of the flowers, shrubs, and trees in the neighbourhood of the Castle. Mr Muirhead pointed out many trees notable for their immense size or striking and graceful beauty. An alder measured 15 feet in circumference; another tree, the Duchess's tree, was about 20 feet, but it was difficult which most to admire.

Very fine oaks, elms, poplars, and firs came under survey. At the gardens, Mr Webster was also of much service to the party, while Mr Muirhead's intimate knowledge of all kinds of plant life proved a great treat. At the gardens the climate and soil are so favourable that camelias and such plants thrive in the open ground. The autumn flowering plants presented a most promising appearance. The skill and taste displayed in laying out the gardens and grounds excited the admiration of all. Mr Muirhead next conducted the party to his splendid collection of Alpine and other plants, and charmed all by his intimate knowledge regarding them. Many of the plants, such as the edel-weiss and others, not a few of the party had never seen growing before. Before parting, Dr Cramond, as President for the year of the Northern Association of Literary and Scientific Societies, desired Mr Muirhead to have the goodness to convey to the Duke of Richmond and Gordon their deep sense of gratitude for the pleasure and profit His Grace had afforded them by granting such generous facilities for inspecting the beauties of nature and art in and around Gordon Castle. Dr Cramond also, in name of the Association, proposed a most cordial vote of thanks to His Grace's commissioner. Mr Muirhead, he said, was imbued with the true scientific spirit. The author of the *Birds of Berwickshire* was known in all scientific circles, and his stores of knowledge had been of the greatest value to them that day in contributing to the enjoyment of one of the best excursions they had ever had. Mr Wallace, Inverness, as secretary of the Northern Association, seconded the motion, which was enthusiastically passed. Mr Muirhead, in reply, said it would give him much pleasure to communicate to His Grace the resolution of the Association. He also thanked the proposer, seconder, and party for the kindly remarks regarding himself, and added that he had been much pleased to meet them all. After tea in the hotel, the party divided, some proceeding to the Highland station for Elgin and Inverness, while the others, after a saunter through the village of Fochabers, returned in the Brakes to Buckie, and thence by train to Banff and elsewhere.







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