

highest zones are the *Crossopodia* shales (Thornilee beds) and the *Retiolites* or *Priodon* flags (Gala group) of Penkill.

The Mulloch Hill beds appear to represent the Brachiopod-schists of Sweden. The calcareous Saugh Hill and *Pentamerus* beds are crowded with *Pentamerus*, *Favosites*, *Petraia*, and other so-called Upper Silurian forms. Their black beds afford the Birk-hill Graptolites. The purple and gray *Crossopodia* shales and flags come into the place of the Tarannon beds of Wales.

Outside the Girvan district proper, the *Priodon* or highest Penkill beds pass upwards into the Straiton group of thin bedded flagstones and shales, affording acknowledged Wenlock Mollusca, and Graptolites. These beds resemble the Hawick rocks in their lithological characters and occupy a corresponding palæontological and stratigraphical horizon.

The Straiton flags pass up into the Lesmahagow series, whose lowest beds are absolutely undistinguishable from the Riccarton flags. Their highest strata swarm with the well-known Eurypterida of Lesmahagow, and are believed to graduate upwards into the basement beds of the Old Red Sandstone of the Valley of the Clyde.

XVII.—CRAIGNETHAN *and its* VICINITY. By JOHN R. S. HUNTER, LL.D., D.Sc., Fellow of the Royal Physical Society of Edinburgh, Fellow of the Edinburgh Geological Society, Corresponding Member.

[Read 24th May, 1878.]

THE parish of Lesmahagow is situated in one of the most picturesque districts of Scotland—one rendered famous by the Falls of Clyde; the lofty and rugged Crags of Cartland, with the new and old bridges; Tinto, the hill of fire, the ancient beacon of the Upper Ward; the Lee Valley, where still stands a noble remnant of the ancient Caledonian forest, known now by the name of the Peas Tree; also Hallbar, the Tower and Fortalice of Braidwood, with its massive walls, six feet in thickness. This parish formed a portion of the Roman province of Valentia, and afterwards of the British Kingdom of Strathclyde, until that kingdom, in the ninth century, became incorporated with those of the Scots and Picts. In many of the deep glens of the district Sir William Wallace

no doubt found frequent shelter. At Gillbank (or Kilbank) he frequently was the guest of his friend Auchinleck. In the adjoining parish of Carluke, at "Forest Kirk," the hero was chosen Guardian of Scotland. In the neighbourhood may still be seen the sites of ancient structures, which remind us of the olden time, "when mailed warriors grimly smiled on the unfurled banner, as the points of a thousand Clydesdale spears glittered in the sun." In fancy we still hear the towers resound with the din and clash of arms.

Craignethan, or Nethane, Castle—variously written Craignithane, Nauthane, Nathane—is also styled Draffin, Draffane, or Draphan Castle, but is better known now as Tillietudlem Castle. With the exception of notices of transmissions of the property, I have not found any historical events connected with Craignethan Castle earlier than towards the end of the reign of James V. The Hamiltons were then a powerful family in Lanarkshire, but Sir James Hamilton of Finnart, who built the castle, was not in possession of lands in Lesmahagow earlier than 1532, and it is possible that the castle did not exist till after that date, and prior to 1538; in which year a charter was granted to the castle and lands, and this is the first time the castle is spoken of.

In 1532 we find a charter connecting Sir James Hamilton of Finnart with Lesmahagow, and another charter in 1538 granting "*Castre de Nauthane et terrarum ejusdem*," &c.

The Castle of Nethane, Craignethan, or Tillietudlem, is believed to be a reconstruction, and very probably it was the site of a former dwelling-house or chapel.

From all we find recorded of Sir James Hamilton, he was undoubtedly a man of great talent and energy, and acquired great power and influence at the court of James V. He was the natural son of the first Earl of Arran and a daughter of Lord Boyd, or of Boyd of Bonshaw, in Renfrewshire. The date of his birth has not been discovered, but a charter to Finnart, in his favour, by his father, is dated 3rd November, 1507, and a deed of legitimation passed the Great Seal on 20th January, 1512.

On 22nd May, 1527, Sir James was appointed Captain of Dumbarton Castle, and held the office for nine years. In 1536 he was Cup-bearer and Steward to the Royal Household of King James V., and, no doubt, was with the King on his memorable voyage, which he undertook to get in marriage the Princess Magdalene of France. He

shipped at Leith, but instead of landing in France, a storm arose and drove the ship to the west shores of Scotland. Sir James was suspected of being instrumental in misguiding the ship, and thwarting the designs of the King; in such circumstances the kindly feeling between them was not greatly cemented. Sir James had now extensive estates in Lanarkshire and elsewhere, and maintained a retinue equal to the first baron of the land. King James V. paid a visit to Craignethan in 1540, to assist at the marriage of Sir James's daughter, Agnes, with James, Master of Somerville, Carnwath. Not long after this, Sir James Hamilton fell into bad grace with his Majesty, and his estates being forfeited became vested in the Crown, while David Orrok was made keeper of the castle.

From Sir James Hamilton's position with the King, it is probable that much of his wealth was conferred on him by that monarch, and there is a charge in the Memorials of Edinburgh Castle, which, though possibly fictitious, points to one source of wealth, viz.:—for conspiring against James V. and embezzling moneys paid to him, as Royal Architect, for the repair of Castles and Palaces. Under his auspices the Palaces of Falkland and Linlithgow were erected, and the Castles of Edinburgh, Stirling, and Rothesay were rebuilt or adorned by him.

It is not then surprising that Craignethan Castle should have been no mean proof either of the taste or resources of its owners. It may be briefly described as occupying the summit of a promontory, high above the river Nethan. Its enclosures form a parallelogram, the outer walls being of considerable height and thickness, with a gallery or platform extending along the top, while the walls are loop-holed, evidently for defensive purposes. Each angle was defended by a high, square tower, and on one side there are two smaller ones. The tower on the north-east was much the largest, and within it, no doubt, part of the garrison was lodged. Within the enclosure are the remains of a broad ditch, or dry moat, which must have been crossed by a drawbridge. The arched gateway in the west face is most beautiful. At the north-east end of the inner court stands the castle itself, containing the banqueting-hall and principal apartments, the roofs of those on the ground-floor being beautifully arched. Beneath are a series of vaults, so extensive as to suggest the idea that they may have been used for storing provisions and warlike supplies, in the event of a protracted siege—some possibly having been used as dungeons for keeping

prisoners. On the summit of the castle walls there still remain traces of an embattled parapet, with small turrets at the angles.

In 1541, James V., accompanied by his Queen, paid a visit to Craignethan Castle, no doubt to enjoy hunting, of which he was extremely fond. The Castle was then decorated by tapestry, for we find that, by the chamberlain's accounts, tapestry was taken from Crawfordjohn to this castle, and thence conveyed to Peebles and elsewhere.

When Queen Mary escaped from Lochleven, on the 2nd May, 1568, she first took refuge at Niddrie Castle, the property of Lord Seton in Linlithgowshire, and arrived at Hamilton on the 4th of May, and for better security took up her residence at Craignethan Castle, whilst her friends and adherents were assembling from all quarters with the Hamiltons. Sir James joined the Queen's party, and signed the bond of defence, 8th May, 1568. He led the vanguard of the Queen's forces, and was, along with his son, taken prisoner at the battle of Langside. After the defeat there, the Regent Murray made an expedition northwards, at the head of a large force, and took the Castle of Draffane and Palace of Hamilton.

From the Earl of Arran's insanity, his younger brothers, Lord John Hamilton and Lord Claud Hamilton, were regarded as the leaders of their powerful and ancient family—Lord John being in possession of the estates, while, in the event of the death of Queen Mary and her son, he was heir to the throne of Scotland. The Regent Morton had long looked upon the Hamiltons with displeasure, and as his possession of the person of the young King enabled him to overawe him and fix his councils, the destruction of the Hamilton family was determined upon, and at that troubled period reasons were not long wanting for this decision. King James VI. issued a commission to John Earl of Morton, Archibald Earl of Angus and others, dated at Stirling, 22nd May, 1579, and the whole of the Hamilton estates were confiscated—the most cruel and arbitrary proceedings being directed against almost all the gentlemen of the name. A party of soldiers being sent to demand the surrender of Craignethan Castle, the servants, after making what defence they could, were forced to surrender, and the Earl, along with his aged mother, the Duchess of Chatelherault, was sent to Linlithgow, and placed under the custody of Captain Lambie, a creature of Morton's, and a most inveterate enemy of the House of Hamilton, and the same mis-

creant who insulted Queen Mary on her surrender at Carberry Hill.

By an Act of restitution, the estates of the Hamilton family, with the Castle of Draffane, were restored in 1585. In 1587, while the unfortunate Queen Mary was under the sentence of death, she took a ring from her finger, which she ordered one of her attendants to deliver to Lord John Hamilton, telling him that it was all she had left to witness her great sense of his family's constant fidelity to her, and desired it should always be kept in the family as a lasting evidence of her regard towards them. This ring is still preserved in the charter-room at Hamilton Palace.

On 5th May, 1625, James, third Marquis and first Duke of Hamilton, was served heir to his father in the lands of Draffan, with the castle of Nethan. He was a firm adherent of Charles I., and in 1649 was beheaded by order of Oliver Cromwell. He was succeeded by his brother William, second Duke of Hamilton, who died of his wounds after the ill-fated affair of Worcester, in 1651. John succeeded Anne Duchess of Hamilton, who married Lord William Douglas, created Earl of Selkirk in 1646, and Duke of Hamilton in 1660. None of those parties repaired or inhabited the Castle of Draffane, probably because the chiefs of the family found a more suitable residence at Hamilton.

In 1660, soon after the restoration of Charles II., we find Andrew Hay designated "of Craignethane." Hamilton of Wishaw, in his account of Lanarkshire, states that "there was in this parish—Lesmahagow—built by Sir James Hamilton of Phenurd, a great castle, consisting of five towers, called Craignethan, of the ruins whereof Mr. Andrew Hay built a convenient house upon the corner of its garden, after he purchased the same frae the Duchess of Hamilton." The date cut above its northern entrance is 1665. The motive for selling the castle and a portion of the lands of Draffane was that the Hamilton family were deeply sunk in debt.

About 1730 the property was acquired by the Duke of Douglas from Mr. Hay's representatives, and still forms a portion of the extensive possessions of Lord Douglas.

The time being limited, I have deemed it right to bring the historical details to a close, and will now briefly describe, for the benefit of those members of the Society who may not be acquainted with the locality, some of its more salient geological features.

Railways have done much to further geological investigation. When they are being made, we often get good stratigraphical details in their cuttings and tunnels, and by their help we can take distant runs, at a very moderate expense, and see and understand geological features for ourselves. Geology never opens up her treasure-chest, unless we take to the field, and pick the lock. If we do so, hammer in hand, we can climb the hills, ramble through the glens, descend the mines, or trace the numerous workings of the coal, iron, and limestone spoil heaps, with the rich reward of being able thoroughly to understand, for ourselves, the general deductions of geological truths. In strolling over a locality we observe its valleys, its hills, and its streams, and we are apt to consider that what we see has always existed. When, however, we come to examine more minutely, we find it is not so; the structure of the hills, the undulations of strata, the alterations in the water-courses, and the land configuration, all tell us unmistakeably of many and startling alternations of land and water; of the fierce action of volcanic force; of the more subdued, but no less determined, work of arctic cold. The enquirer, by taking advantage of natural sections, sinking of pits, quarry operations, and railway cuttings, has a very wide range for observation and research amongst the old land and water deposits of former ages, still rich with the vestiges of ancient forms of life, and with the phenomena of physical activity.

Very few districts, indeed, present a more interesting and instructive field to the geologist and palæontologist than does the parish of Lesmahagow. The igneous and stratified rocks shown in its numerous romantic glens give many grand and lofty sections of exceeding interest to the physical geologist, whilst the palæontologist can at various points procure fossil remains in abundance. I may briefly state that we have part of the Silurian, the Old Red Sandstone, and the Carboniferous formations, the latter being well represented, and in numerous localities the various deposits of the Drift series. Igneous rocks occur frequently, causing numerous faults or dislocations, some being of great extent. The economic minerals are abundant, and some are of great value. The Lesmahagow gas or cannel coal is world-famous, whilst the limestones, ironstones, and coals are largely worked. The Silurian and Carboniferous formations have yielded many rare genera and

species, but the Old Red Sandstone, which extends over a considerable area, has as yet proved almost devoid of organic remains, in this respect resembling the Old Red of the Edinburgh district. In the Tilestones, or Mudstones of the Silurian, there have been discovered, by Dr. Slimon and others, great quantities of most beautifully preserved Crustaceans, such as *Pterygotus bilobus*, *P. raniceps*, *Slimonia acuminata*, and *Ceratiocaris papilio*.

The stratigraphical and palæontological details of Lesmahagow are somewhat similar to those of Carluke parish, as may be seen by the following table:—

SECTION OF STRATA, LESMAHAGOW.

- | | |
|--------------------------|---|
| 1. Upper Coal Measures. | } <i>Carboniferous or Mountain Limestone.</i> |
| 2. Millstone Grit. | |
| 3. Upper Limestone. | |
| 4. Middle Coal Measures. | |
| 5. Lower Limestone. | |
| 6. Lower Coal Measures. | |
| 7. Old Red Sandstone. | |
| 8. Silurian Strata. | |

Within a very short distance from Craignethan Castle, at the Fence Pit, opened up by the Nitshill and Lesmahagow Coal Co. for the working of the famous Lesmahagow gas coal, we have presented to us a most interesting section, embracing strata of the upper coal measures, down to the base of the middle coal measures, the depth of shaft being 355 yds. 1 ft. 4 in., whilst in the adjoining glens we find the lower limestones, lower coal measures, and Old Red Sandstone.

In the lower limestone series is the oyster band, or *Productus giganteus* bed. It is seen in position in various points through the parish, and contains vast numbers of *Productus giganteus*, some of a very large size, while other molluscos remains are numerous. The main limestone and shales above produce fine cabinet specimens of the various genera and species usually found in the West of Scotland. In ascending the strata we find the position of the Hosie limestone, Raes Gill ironstone beds, 1st calmy limestone, 1st and 2nd Kingshaw limestones, with their accompanying fossiliferous shales, lingula limestone, and lingula beds, all containing vast quantities of fossil remains.

I now give a section of Fence Pit, as in it we find the various positions of our famous hunting grounds for fossil remains, viz., Lesmahagow gas-coal and ironstone, Maggy ironstones, Howgate limestone, Belstaneburn limestone and shales, Gare limestone and shales, and other higher series. The Levenseat limestone is not represented here, and it seems to be very partial in its distribution, being found only in a few localities, viz., Auchterhead, Cambusnethan, Calderbank, Monkland, Levenseat, and near Bathgate.

SECTION OF CARBONIFEROUS STRATA, FENCE PIT,
LESMAHAGOW.

	Faths.	Feet.	Inches.		Faths.	Feet.	Inches.
Surface,	7	1	...	Sandstone, . . . . .	...	2	8
Sandstone, laminated, . . . . .	...	3	11	Shale, . . . . .	...	4	3
Coal (Woodend Coal), . . . . .	...	2	7	Sandstone, . . . . .	...	4	4
Sandstone, . . . . .	...	...	11	Shale, . . . . .	...	4	3
Shale (Ironstone Balls,) . . . . .	...	4	9	Coal, . . . . .	...	2	5
Fire-clay, . . . . .	...	...	11	Fire-clay, . . . . .	...	...	8
Shale, . . . . .	...	1	4 5	Sandstone, laminated,	1	2	...
Kingle, . . . . .	...	...	8	Shale, . . . . .	...	1	3
Shale, . . . . .	...	3	5	Coal, . . . . .	...	...	10
Coal, . . . . .	...	...	4	Fire-clay, . . . . .	...	5	9
Fire-clay, . . . . .	...	5	5	Shale, . . . . .	...	2	...
Sandstone, laminated,	3	1	11½	Sandstone, . . . . .	...	3	...
Shale,	1	1	4	Shale, . . . . .	...	1	9
Sandstone, . . . . .	...	3	8	Ironstone (Slatey Iron- stone), . . . . .	...	...	1½
Coal, . . . . .	...	1	0½	Shale, . . . . .	...	2	...
Fire-clay, . . . . .	...	3	1	Coal, . . . . .	...	...	9
Shale, . . . . .	...	1	4 7½	Fire-clay, . . . . .	...	1	4
Sandstone, laminated,	2	1	9	Sandstone, laminated, . . . . .	...	5	0½
Shale, . . . . .	...	4	2½	Shale, . . . . .	...	2	4½
Sandstone, laminated, . . . . .	...	3	2	Whinstone, . . . . .	...	3	3½
Fire-clay,	1	1	11	Shale, . . . . .	...	5	11½
Sandstone,	2	2	3	Coal, . . . . .	...	1	7
Fire-clay, . . . . .	...	4	1	Fire-clay, . . . . .	...	1	...
Sandstone,	1	2	3	Sandstone, laminated, . . . . .	...	4	5½
Shale, . . . . .	...	1	9	Shale, . . . . .	...	2	1
Coal (Crofthead Coal), . . . . .	...	2	...	Sandstone, laminated,	1	2	10
Fire-clay, . . . . .	...	3	10	Shale, . . . . .	...	3	5
Shale, . . . . .	...	1	4	Coal, "Burnt," . . . . .	...	...	10
Coal (Stinking Coal), . . . . .	...	2	...	Fire-clay, . . . . .	...	1	6
Fire-clay, . . . . .	...	2	8				

SECTION OF CARBONIFEROUS STRATA—*Continued.*

	Faths.	Feet.	Inches.		Faths.	Feet.	Inches.
Sandstone, laminated, .	1	3	9	Fire-clay, . . .	...	4	9
Ironstone, Limey (Gin- stone Ironstone),* }	...	...	8½	Sandstone, . . .	1	4	2
Sandstone, laminated, .	1	1	8	Coal, . . .	...	...	4
Fire-clay, . . .	...	1	1	Fire-clay, . . .	...	...	10
Coal, . . .	...	1	3	Coal, . . .	...	...	2
Fire-clay, . . .	...	...	7	Fire-clay, . . .	...	1	8
Sandstone, laminated, .	...	2	9	Sandstone, laminated, .	1	...	...
Shale, . . .	...	...	3	Fire-clay, . . .	1	1	6
Coal, . . .	...	...	1	Sandstone, . . .	1	5	10
Fire-clay, . . .	...	...	8	Coal, . . .	...	...	6
Sandstone, laminated, .	2	5	9	Sandstone, laminated, .	...	...	8
Shale, . . .	...	5	5½	Fire-clay, . . .	...	1	7
Sandstone, . . .	...	...	6	Sandstone, laminated, .	6	5	3
Shale, . . .	...	2	9	Fire-clay, . . .	...	4	10
Sandstone,* . . .	1	1	6	Sandstone, . . .	3	...	8
Shale, . . .	2	...	...	Shale, . . .	...	1	11
Sandstone, . . .	3	...	...	Sandstone, laminated, .	1	3	...
Shale, . . .	2	...	...	Shale,* . . .	4	2	...
Sandstone, . . .	...	...	3	Sandstone, laminated, .	...	2	6
Shale, . . .	...	...	6	Limestone (Gare Lime- stone),* }	...	3	7
Sandstone, . . .	...	...	6	Fire-clay, . . .	...	1	4
Shale, . . .	1	1	6	Sandstone, . . .	8	5	10
Fire-clay, . . .	...	...	6	Shale,* . . .	4	3	3
Ironstone (Curly Iron- stone),* }	...	...	4	Limestone (Belstane- burn Limestone),* }	...	3	2
Shale, . . .	...	...	5	Shale,* . . .	...	...	3
Fire-clay, . . .	...	2	...	Sandstone, . . .	...	1	9
Sandstone, . . .	1	5	...	Coal, . . .	...	...	3
Shale, . . .	...	1	2	Sandstone, laminated, .	6	3	5
Sandstone, laminated, .	...	5	6	Kingle, . . .	...	1	2
Fire-clay, . . .	1	1	9	Sandstone, laminated, .	2	4	...
Fire-clay, very dark, .	...	1	11	Fire-clay, . . .	...	1	10
Kingle, . . .	...	...	11	Coal, "Parrot," . . .	...	...	4
Sandstone, laminated, .	1	1	8	Sandstone, . . .	1	3	10
Fire-clay, . . .	...	2	10	Shale, . . .	...	3	...
Sandstone, laminated, .	1	2	10	Fire-clay, . . .	...	3	...
Shale, . . .	...	3	1	Sandstone, . . .	5	4	2
Coal, . . .	...	...	3	Shale,* . . .	2	2	...
Fire-clay, . . .	1	5	...	Limestone (Howgate Limestone),* }	...	5	8
Sandstone, laminated, .	...	2	10	Sandstone, . . .	...	...	8
Coal, . . .	...	...	5				

* Fossil remains.

HUNTER—CRAIGNETHAN AND ITS VICINITY.

93

SECTION OF CARBONIFEROUS STRATA—*Continued.*

	Fathoms.	Feet.	Inches.		Fathoms.	Feet.	Inches.
Coal,	2	Fire-clay, . . . . .	...	2	...
Sandstone,	5	4	10	Sandstone,*	2	2	4
Shale,	2	2	Coal, . . . . .	...	...	8½
Coal,	1	2	Fire-clay, . . . . .	...	...	4½
Sandstone,	1	2	5	Coal, . . . . .	...	...	5½
Shale,	3	6	Ironstone,* . . . . .	...	...	3½
Coal,	1	Coal, . . . . .	...	...	9
Fire-clay,	1	5	Sandstone,	1	...	10½
Sandstone,	3	...	Shale,*	3	...	9
Coal,	3	Ironstone (Maggy Iron- stone),* . . . . .	...	...	3
Fire-clay and Ironstone } Balls,*	5	10	Shale,*	1	3	...
Coal,	1	4	Sandstone, laminated, . . . . .	...	2	11
Fire-clay,	2	3	Coal, . . . . .	...	...	2
Sandstone,	1	7	Sandstone,* . . . . .	...	...	2 3
Shale,	1	4	Fire-clay, . . . . .	...	2	...
Trap Rock,	1	5	3	Shale, . . . . .	...	4	9
Sandstone,	6	Coal, . . . . .	...	...	10
Shale,	2	4	Shale and Ironstone Balls,* . . . . .	...	5	3
Smithy Coal, "Burnt,"	1	1	1	Gas Coal (Lesmahagow } Gas Coal), . . . . .	...	1	9
Fire-clay,	3	1	Ironstone,* . . . . .	...	...	4
Coal,	3	Fire-clay, . . . . .	...	...	3
Sandstone,	2½	Coal, . . . . .	...	...	7
Coal,	1½	Fire-clay, . . . . .	...	1	...
Sandstone, laminated,	1	5	2	Coal, . . . . .	...	...	7
Shale,	1	4	Sandstone, laminated,	4	2	1
Sandstone,	4	5½	Fire-clay, . . . . .	...	1	...
Shale,	6	Sandstone, . . . . .	...	5	6
Coal,	4½				
Sandstone,	1	...	8				
Shale,	1	6	Total depth of Shaft,	177	4	4
Coal,	6½				

Before closing these remarks, I cannot refrain from saying a word or two on the Drift series, near the Clyde. I have procured a number of journals (from my friend Mr. Dunlop, Braidwood), showing the depth of sand and gravel at various points, from Foot of Nethan up to Bankend, Crossford, which are as follows:—

	Fathoms.	Feet.
1st. No. 5 Bore, Foot of Nethan, Clydegrove, Sand and Gravel,	9	4

* Fossil remains.

94 TRANSACTIONS OF THE GEOLOGICAL SOC. OF GLASGOW.

	Fathoms.	Feet.
2nd. No. 4 Bore, near Clydegrove House, Sand and Gravel,	8	3
3rd. No. 3 Bore, Clydevale, Sand and Gravel. Stopped,	4	3
4th. No. 2 Bore, Clydegrove, Sand and Gravel,	7	4
5th. No. 1 Bore, Clydegrove, Sand and Gravel,	7	0
6th. No. 1 Bore, Bankend, Crossford, Surface Earth and Sand,	2	0
Blue Clay with Stones,	14	3
7th. No. 2 Bore, Bankend, Crossford, Surface Clay and Stones,	1	0
Sand and Gravel,	4	3
Blue Clay and Stones,	2	3

On Laird Lang's property, near Nethan, but up a considerable distance from Clyde, a bore was put down 42 feet through pure sand, and was still in it when boring was left off. Again, on the top of the hill at Crossford, belonging to Mr. Templeton, sand of a fine description is seen cropping out to the surface, and below this about thirty feet of clay is got. On the other side of Clyde, in Carluke parish, in sinking the Gas-coal Pit, at Orchard No. 1, Joseph Reid's garden, the bore passed through eight fathoms of surface clay, and immediately below it came on a bed of pure moss, four feet thick, containing nut shells; below this again was a little blue clay. In working dross coal on the same lands, they came on a part where the coal was worn away by the action of water, the coal being finely polished, and a space where it was wanting being filled up with sand and gravel. From my investigations around the locality, I am led to believe this to have been the ancient water-course of the Mouse water, coming through the Lee valley, where still may be seen great quantities of sand and gravel. The bed of moss under the clay is a curious phenomenon, at all events in this locality, and it seems to me to corroborate the views held by one of our most distinguished geologists, Dr. James Geikie, F.G.S., as to the existence of two glacial epochs, separated by an inter-glacial age, in which the sheet ice disappeared, and the temperature rose to a point admitting of the return of various forms of animal and vegetable life.