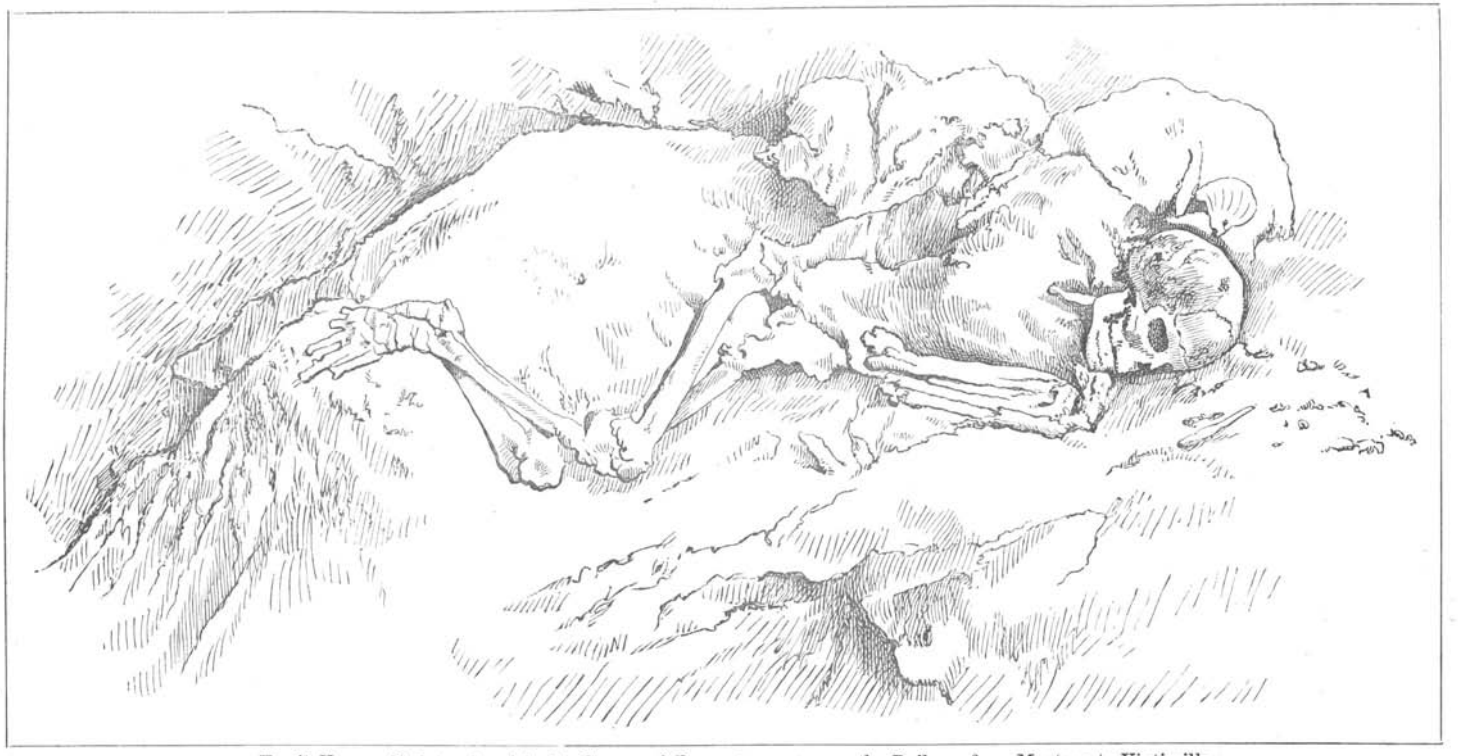
Lord Enniskillen's specimen of *Uronemus lobatus* is four inches and a half long; the extremity of the tail is however deficient. At the very front of the snout, the impression of a small portion of bone is seen, whose edge must have been set with a row of small pointed teeth, these also being only seen in impression. About three-quarters of an inch back from the end of the snout, and in the middle of the confused and unreadable mass of bony matter representing the head, are distinctly seen several conical smooth tooth-like bodies one-fourteenth of an inch in length. They are apparently in an upper and lower opposing set; the upper are evidently palatal the lower may appertain to the lower jaw. Possibly they may be denticulations of Ctenodont plates, but from the state of preservation of the head, it is hardly possible to say so with certainty. The specimen is rather injured on the hæmal aspect of the caudal region, so that no additional information regarding the anal fin is gained from it, nor from the other specimen in the cabinet of Sir Philip Egerton. The latter measures three inches and a half in length. The head and the anterior part of the trunk are wanting, but the tail is shown to nearly its termination; the greater part of the dorso-caudal fin is present, but the lower lobe of the caudal is rather deficiently exhibited. This specimen shows, however, a well-marked, narrow, lanceolate, ventral fin one inch long, and three-sixteenths of an inch broad at its middle. Many of its fine rays are visible, but the state of preservation of the fin is unfortunately not sufficiently good to enable one to recognize its exact structure, though its general aspect is certainly that of an acutely lobate member.

NOTICES OF MEMOIRS.

I.—Discovery of a Human Skeleton in a Cavern in Italy.

THE announcement has been made, in "La Courrier de Menton," of the 7th of April, of the discovery of a human skeleton, in one of the caves of the frontiers of Italy, by Monsieur E. Rivière, who is entrusted by the French Government with a scientific mission —having for its object the study of the natural and prehistoric history and palæontology of Liguria.

Subsequently to the discovery, in the neighbouring quarries, of an immense quantity of bones, teeth, and fossil horns, of gigantic stags, rhinoceros, hyænas, bears, and other quadrupeds, sent by him to the national museum, M. Rivière has devoted himself, latterly, to the opening of caverns. The skeleton which he has just discovered was found in the large cavern of Baoussé-roussé, buried beneath a layer of earth several yards thick. This cavern is called, in the dialect spoken at Grimaldi, the "Barma du Cavillon"; that is to say, the cavern of the little cheville (*barma* signifying cavern, and *cavillon*, the diminutive of *cavilla*, bolt), a name given to it from time immemorial, because there has always been a piece of wood placed transversely over the front. This was destroyed when the



Fossil Human Skeleton found in the Cavern of Baoussé-rousse, near the Railway from Mentone to Vintimille.

railway was made from Mentone to Vintimille. In front of the cavern, and at a distance of five or six yards from the place where the recently-discovered skeleton was met with, there was, sixty years ago, an immense carob-tree, which almost entirely blocked up the mouth of the cavern, and gave it a sombre and dismal appearance.

The state of preservation of the skeleton is very remarkable and astonishing, seeing that its age, which it is impossible to estimate with exactitude, must extend backwards into pre-historic times. This extraordinary state of preservation may possibly be explained by an analysis of the earth in which it was found, and the uninterrupted dryness of the sheltered spot in which it was placed.

The careful way in which the surrounding ground has been cleared away, has had the effect of preserving the position which the skeleton has retained ever since it has occupied the spot where it was found. With the exception of the fragile ribs, which have been broken by the pressure of the overlying soil, the subject is entire. The legs crossed in a natural position, and the two arms folded near the head, seem to lead to the conclusion that the man to whom they belonged died in his sleep, and that he had been carefully covered with earth, without disturbing the ground beneath. The thigh-bones measure 16 inches in length from one extremity to the other, and the rest is in proportion—or in other words, the skeleton is that of a man of ordinary stature. The teeth and the lower jaw are in a very good state of preservation. The cranium, of average size, is of a dark brick-red colour, and the part resting on the ground is broken by pressure. Its colour, different from that of the other bones, does not seem capable of positive explanation. There is an immense number of small shells adhering to the cranium, leading one to suppose that these shells, all drilled with a hole, have been used for ornament, either twined in the hair or as part of a head-dress.

Round the skeleton were found several flint implements, such as scrapers, chisels, and axes, together with bone needles, the curious fashioning of which seems to have been effected by rubbing or grinding down on some hard substance. There were also found the bones of animals, and, amongst others, the lower jaws of herbivora. Behind the head a stone was met with, another behind the loins, and between the former and the head two stone implements of the largest size found in these caverns.

All the curious objects which have been discovered by Dr. Rivière, have been photographed by an able operator, M. Anfossi.

H. W. Bristow.

II.—Paléontologie Française, ou description des Fossiles de la France, continuée par une réunion de Paléontologistes, sous la direction d'un Comité Spécial. 2me érie—Végétaux. Plantes Jurassiques. Par M. Le Comte de Saporta.

THIS work of mine, of which I would give a sketch to the readers of the Geological Magazine, treats of the group of fossil plants of the French Jurassic period. I should not have undertaken it had I not received the friendly co-operation of a large number

of geologists, who have liberally given me access to their collections, as well as the patronage and advice of M. Ad. Brongniart.

By a coincidence which it is natural to mention here, the *Histoire des Végétaux Fossiles*—the eminent but incomplete work of the illustrious French savant—stops just towards the end of the Cryptogams, and thus excludes the greater number of the Jurassic species, some because they belong to the class of Gymnosperms, others because they were not known at the time when M. Brongniart published his *Histoire*. This work is thus taken up almost at the point where M. Brongniart's has left off. The need of the publication is obvious from this statement; the subject is in itself interesting. The Jurassic period, from a biological point of view, constitutes a kind of middle age, equally distant from the Palæozoic and Neozoic periods. It serves, so to speak, as a hyphen between epochs which, without it, would present a complete contrast; but this hyphen itself corresponds to a very long period.

The configuration of the European land modified several times, the deposits varying in their nature and aspect, new series of marine animals substituting themselves for former ones, and eliminated in their turn by others,—all these phenomena, by their intensity and repetition, bear witness to the immensity of the period. Nevertheless, it is to be observed, that the vegetation appears to have changed less than anything else. Not only has it preserved longer than the population of the sea the species it contained at a given time in the period, but its general characters and the relative disposition of its elements have suffered far less alteration from the lapse of time; in a word, it has remained almost stationary from one end of the period to the other, instead of visibly progressing, as is proved, respecting the Cretaceous plants, by comparing those which existed in the Wealden with the Flora of the white Chalk or Santonien. That is, in my opinion, the principal feature of the Jurassic vegetation. Consult from this point of view the Keuper, the Rhætic, the Oolite, or the Wealden; that is to say, place yourself in the age which immediately precedes the period, at its beginning, middle, or even at the end, there is almost always the same general physiognomy to be observed; and the Ferns, the *Equisetaceæ*, the *Cycadaceæ*, and the *Coniferæ*, that one meets, are combined in relative proportions which vary very little. A second phenomenon, which is not without connexion with the last, consists in the recurrence of similar, but not absolutely identical forms, although it is difficult at times to distinguish them, which have just shown themselves in successive stages separated by intervals more or less long, as if the same forms re-appeared still recognizable, although slightly modified.

It is thus that several Rhætic species seem to re-appear in the Oolite, and some of these, like the *Baiera digitata*, Schimp., to return in the Wealden under the name of *Baiera pluripartita*, Schimp. One cannot reasonably assign to these singular parallelisms, which I have attempted to sum up, any other cause than the persistence or the reproduction of the same physical conditions, bringing with it the preservation or the return of the same organic combinations.

Considered as a whole, the Jurassic vegetation seems to have been poor, monotonous, and almost entirely composed of tough plants with hard and meagre foliage, little capable of furnishing nourishment to animals. Thus the contemporary terrestrial animals were generally carnivorous, and the mammifers particularly nearly all insectivorous. The small dimensions of most of the plants of this epoch result from the comparison of their different organs with those of species which correspond to them in the same natural Order. The largest Jurassic *Cycadaceæ* are not equal to those of our time; several were far smaller, or even were only a few inches high. So also with a great number of Ferns. We do not find in the plants the gigantic proportions assumed by the greater number of the contemporary reptiles. However, to avoid exaggeration, we must state that the fronds of some ferns must have measured a considerable size in their integrity, and that the *Coniferæ*, especially the *Cupressinites*, present arborescent types of the first magnitude. Nevertheless, when one studies the Jurassic plants closely, nothing rich or luxuriant discloses itself, and one is struck by the extreme simplicity of the group. *Equisetaceæ*, Ferns, *Cycadaceæ*, *Coniferæ*, some rare Monocotyledons, are the sole constituent elements of the terrestrial vegetation. Add some rather rare *Characeæ* and *Algæ*, and we shall have enumerated all the Orders of plants which peopled the land and waters of our country at that period. These are some of the most startling peculiarities that the study of these diverse groups brings to light.

The list of *Algæ* is in accordance with the importance of the marine deposits and the predominance of the seas, at an epoch when central Europe still formed an archipelago, whose islands tended to unite themselves without being definitely welded into a single continent. To explain the method of determination which I have applied to the Jurassic *Algæ* would carry this beyond the bounds of a simple notice. It is very evident that the greater number of these plants *must* have perished without leaving any trace. The impressions which have come down to us are all the more interesting, and—irrespective of doubtful forms which the desire of being complete urges an author to describe, without having a very lively faith in the objects which he desires conscientiously to make known—there exist others that are trustworthy; an examination of these suggests many curious remarks. Thus the class of *Algæ*, conformably with what has taken place in the greater number of marine organisms, has altered very gradually, and the obstinate persistence, so to speak, of certain types of Jurassic *Algæ*, establishes this in a surprising manner. In support of this I will adduce three kinds of *Algæ* chosen from those best characterized: to two of them I have given the names *Siphonites* and *Cancellophycus*; the third is the large genus *Chondrites*, Sternb., several times altered, but very natural when we only include species with the same facies. The connexion between *Chondrites* and the existing *Gigartinæ* is the more probable, as several of the Jurassic species exhibit globular swellings, very analogous to the *Sporangia* of the living members of this family. The *Chondrites* were without

doubt true *Florideæ*, with stiff cartilaginous fronds like those of *Chondrus*, *Gelidium*, *Gigartina*, etc. Their development reaches its height in the Jurassic period; but, far from being limited to that period, they extend into the Chalk, and appear anew in the Flysch, towards the middle of the Tertiary epoch. The forms under which they then show themselves are so similar to those which they had in the Jura, that there necessarily exists much confusion between the species of the two ages, which is difficult to unravel, but which witnesses at least to the persistence of the genus during a prodigious space of time. The origin of the *Chondrites*, certainly previous to the Jurassic period, is connected with the very origin of organic life, since it seems more than probable that one part at least of the Silurian *Bythotrephis* of J. Hall, and especially *B. gracilis*, with its varieties, differ in no respect from true *Chondrites*.

Siphonites Herberti, nov. sp., an Alga, with a simple cylindrical and fistulous frond, closed at the top like the finger of a glove, more or less allied to *Codium*, and therefore to *Caulerpites*, has been found by M. Hérbert at the very base of the Lower Lias; it has an incontestable affinity, approaching to identity, with the *Palæophycus virgatus*, J. Hall, a Silurian species which comes from the same American beds as the *Bythotrephis*.

Cancellophycus, so widely spread over the bosom of the Jurassic seas, and of which *Chondrites scoparius*, Thioll., is the type, is allied, like *Chondrites* and *Siphonites*, though in a less direct manner, to Palæozoic genera, particularly to *Spirophyton*, Hall, of the American Devonian, to the *Alectorurus*, Schimp., of the Swedish Silurian, and above all to the *Caulerpites marginatus*, Lesq. (*Physophycus*, Schimp.), of the Carboniferous of Pennsylvania. The fronds of *Cancellophycus* were fixed by the centre or the base, and formed a foliaceous expansion, more or less scalloped or lobed at the margin, with rows of perforations disposed in ramified lines radiating from the point of attachment, spirally twisted, or rather folded back on themselves from the periphery. The substance of these fronds, probably of a cartilaginous nature, was thus perforated with a multitude of narrow and regular openings, as if made by a punch. This type, which in one direction mounts to the Silurian, shows itself in an opposite direction in the midst of the Flyschian sea. Amongst the existing Algæ, the most analagous is *Thalassophyllum clathrus*, Post. and Rupr., a species of the family of *Agari*, and of the order of *Laminariæ*, which inhabits the coast of Kamtchatka, and the fronds of which, pierced with regular perforations larger than those of the fossil fronds, attain a diameter of six feet. It is probable from this resemblance that the *Cancellophycus*, like the *Agari*, have formed part of the group of *Laminariæ*, or at least of a group allied to it.

The *Algæ* of the Secondary seas comprised then, according to all appearance, Zoospores and Florides. The presence of *Dictyotaceæ* at the same epoch is proved by the *Fucoides erectus*, Bean (T. Leckenby. Oolitic Plants, Quart. Journ. Geol. Soc., vol. xx., p. 81, tab. xi., figs. 3*a* and 3*b*), a species from the Great Oolite of Scarborough, in

which M. Schimper has recently recognized a veritable *Haliseris*. The Fucaceæ, properly so called, on the contrary, would apparently have still been absent, and this absence would support the opinion of those who recognize in them the most highly organized of all the *Algæ*. The same appearance is not presented on the land; we may say that it varies according to the groups we examine. The persistency of the structure of *Equisetum* is well known; those of the Jurassic epoch are distinguished by their great height, sometimes relatively gigantic, a characteristic nevertheless that would not apply to all the species. The Ferns present a singular combination of extinct types, and types whose affinity to those of the present day cannot be mistaken. *Clathropteris*, *Thaumatopteris*, and several other genera with reticulated nerves, whose fructification have recently been observed, are scarcely distinguishable from the living *Drynariæ*, with which we should perhaps have classed them if there had been fossil species. We might state also that several *Tæniopteridæ* range themselves without much effort by the side of *Marattia Danæa* and *Angiopteris*, and consequently amongst the *Marattiaceæ*; but besides these partial assimilations, which the discovery of organs of reproduction has legitimized, there exist a number of types that we are compelled to group artificially, so uncertain are we still on the subject of their true affinities. Respecting many of them, one would be even compelled to believe that they are really without any actual affinity to any of the living genera capable of being compared to them. Hence the method of classification, founded by M. Ad. Brongniart, and based solely on the characteristics of the nervation, takes the precedence, and ought to be exclusively employed as the only one which does not lead to erroneous results.

The Jurassic Ferns of France comprise a moderately large number of species, and even of entirely new genera. I would here offer an explanation of those differences which are calulated to strike the mind when one proceeds to enumerate the different local vegetations.

Several of the localities whence the French fossils come, amongst others that of Hettange (Moselle), of Chatillon-sur-Seine, of Lourdines (Vienna), of Saint-Mihiel (Meuse), etc., represent ancient sea-shores where the mere action of the water washing away the earth and of the wind have contributed to carry the plant to the bottom of deep creeks and bays filled perhaps with a pure chalky slime or fine mud hereafter converted into sandstone. The plants collected under these conditions differ more or less from those which we meet with in the marly and bituminous schists which must have been deposited at the bottom of the peaty lagoons or estuaries of that epoch. It is to the formation of this last kind that it is expedient to ascribe the Rhætic Flora of Franconia, and that of the Oolite of Scarborough. These floras have transmitted to us the vestiges of a fresh and luxuriant vegetation, whose growth was favoured by the influence of the waters, and which was without doubt quite distinct from that which covered the interior of the lands. It is, on the contrary, that second vegetation to which I may naturally apply the name of *sylvan*, because it extended uniformly over the surface of the Jurassic regions, of which the fossils collected

in France most often convey the appearance. The first restricted to the watered places occupied only the bottoms of valleys, the neighbourhood of waters, and the edges of the mouths of rivers. Tough Ferns, of small and ordinary growth, monotonous in aspect, often however generically distinct despite this monotony, together with Cycads scarcely varying, and Conifers of full stature, compose the group of *sylvan* flora, the details of which change more than their fundamental structure as one passes from one stage to another.

I will say little on the subject of Cycads, to which I purpose returning later. The discovery of some of their organs of fructification, the minute observation of their trunks, of their mode of growth, and of the relative peculiarities of the development of their leaves, will lead without doubt to a satisfactory solution of questions quite as obscure as those which their determination raises.

For the present we must believe that the Cycads of Jurassic Europe are not directly allied to any of those now existing. The living Cycads occupy, in small scattered groups, some Central America and the dependent islands, others Southern Africa, others again the islands of India and Japan, or finally New Holland. Each one of these regions, it must be remarked, possesses special genera of Cycads. There is then nothing surprising in the fact that our continent has in times past possessed its own Cycads, represented by genera peculiar to itself.

The examination of the Conifers would carry us further still; besides, their study is far from complete; and it will be time, when this has been done, to state the definite results. One must admit as probable that in the Lias ambiguous types have entirely disappeared, the last continuations of the *Walchia* of Permian strata, of *Voltzia* and *Albertia* of Keuper, and the first outlines of groups which perfected themselves afterwards, and still occupy the earth; whilst in the Oolite the oldest *Araucaria* and *Sequoia* show themselves related to the true *Cupressinites*, more or less allied to the existing *Thuyiopsis*, *Retinospora*, and *Widdringtonia*. They were without doubt the only large trees of those past times, under whose shade the other plants took shelter. The climatic conditions were still far from what they have since become; nothing resembling the Zones disposed after the manner of latitudes then existed; and a sensibly equal heat stretched over every part of the globe. Nevertheless, it does not seem to follow from the examination of the indices furnished by the plants, that the temperature of Europe would at that time have been higher than that which countries situated near the tropics now enjoy. An annual mean of 77° Fahr. suffices to explain all the phenomena which the Jurassic vegetation displays.

SAPORTA.

III.—A Sketch of the Geology of the Neighbourhood of Banbury. By Thomas Beesley, F.C.S.

Read at the Annual Meeting of the Warwickshire Naturalists' and Archæologists' Field Club, at Warwick, 5th March, 1872.

THE district described by the author is that on either side of the River Cherwell, which rises twelve miles E.N.E. of Banbury,

and joins the Thames near Oxford to the south; the valley in which it flows gradually narrowing in that direction, while to the north it is spread out, and almost divided into two portions by a ridge of Lias Marlstone; extending from Hardwick to Fenny Compton, this formation also forms the table-land on either side of the valley.

The lowest zone of the Lias visible at Banbury is that of *Ammonites Henleyi*, from which beds the author obtained 103 species of fossils and a large number of Foraminifera; he describes the beds as consisting of dark-blue shaly marls, with occasional septaria and nodular phosphatic concretions, with a thin bed of hard grey shelly Limestone near the top, known as "Banbury Marble."

From the *Capricornis* zone, visible in the brick-yard, by the west side of the canal, south of the town, he obtained 25 species, amongst them *Cardium truncatum, Modiola cuneata.* The *Am. Jamesoni, Henleyi,* and *Capricornis* zones the author calls the Lower Middle Lias, to distinguish them from the Marlstone rock-bed and its underlying marls; the last two zones he considers to be forty feet in thickness.

His *Upper Middle Lias* is made up of the *Am. margaritatus* beds of Twyford Wharf, south of Banbury, with 40 species of fossils, and the Marlstone rock-bed or zone of *Am. spinatus*, which is about twelve feet in thickness, and forms a broad table-land on the south and west, and a terrace on the east side, the disintegration of which has formed the rich red wheat-growing land, described by Arthur Young "as the glory of Oxfordshire." On Edgehill escarpment it rises to an elevation of 720 feet above the sea-level, dipping down to 500 feet at Banbury.

The following section is given of the Marlstone at the King's Sutton ironstone-works:—

	Ft.	In.
Soil, sandy and ferruginous	2	6
Upper *Rhynchonella tetrahedra* bed (Marlstone)	0	8
Marlstone	2	6
Lower *Rhynchonella* and *Terebratula* bed (Marlstone)	1	0
Marlstone with concretions...	1	0
Rusty ferruginous concretions	1	8
Sandy blue marl and grey shale		

The concretionary nodules are rich in phosphates, and are, no doubt, partly the cause of the fertility of the marlstone soil. Silicate of iron grains often occur, so as to give almost an Oolitic structure to the Marlstone; these grains are sometimes hollow, and appear to have been moulded upon the shells of Foraminifera and Entomostraca. The rock-bed is a sandy ferruginous limestone, brown outside, and greenish blue in, separated by thin partings of sandy loam and clay. North and west of Banbury the rock becomes thicker, and is largely quarried for paving, troughs, and gravestones. The Hornton stone has been much used in the old churches, and wears well.

Large excavations have been made in the marlstone on both sides of the valley at Adderbury and King's Sutton, four miles south of Banbury, near the Great Western Railway and Canal, for the purpose of smelting to obtain the iron which is found in the Marl-

stone, in variable proportions, that of King's Sutton ranging from 18·7 to 25·5, and even to 34 per cent. of iron, but the richer samples are very sandy.

When richest it will yield as much, according to Prof. Phillips (Geol. of Oxford, etc.), as "30,000 tons to the acre, every three tons of the best samples producing one ton of iron."

From the Marlstone beds Mr. Beesley obtained 69 species of fossils, and from the whole Middle Lias 190; from the Adderbury quarry he mentions a large trunk of Coniferous wood, and describes drift-wood as common in the Marlstone.

Detached outliers of Upper Lias occur on Crouch and Constitution Hills, on the Marlstone plateau, and fringes along the slope of the valleys to the west, reaching a thickness of 100 feet of blue whitish clay, with earthy limestone separated by thin shales.

The *Saurian and Fish zone* of Somersetshire was discovered by Mr. Beesley, at Middleton Cheney and Thenford to the east, and by Mr. Judd, F.G.S., at Sibford, seven miles west of Banbury. The "Upper Cephalopoda beds" of Somersetshire, described by Mr. Moore, F.G.S., are constant in the former district; from these Upper Lias beds were obtained 124 species, including 2 vertebrata and 2 corals. Two years ago it was shown by Mr. Judd, late of the Geological Survey, and by Mr. Sharp, F.G.S., of Dallington, that the Northampton sands (which, in opposition to the views of Dr. Lycett, Prof. Morris, and the Rev. P. B. Brodie, have been held by many eminent geologists to be the base of the "Great Oolite"), were really the *Inferior Oolite*. Mr. Beesley has not only been able to confirm this, but has discovered the Inferior Oolite rock-bed, probably a part of the Freestone division.

The marlstone plateau to the south is bounded by the Northampton Sands "from Swerford on the west, by Great Tew and Dun's Tew to near Deddington." It also forms the east and west slopes of Constitution Hill, where loose sandy beds occur; at Milcomb Hill are sandy limestones, and at Sibthorp a light brown thick-bedded limestone is quarried for building. The sandy beds sometimes reach a thickness of 30 feet, and are of a red, orange, grey, or white colour.

In the limestones occur, *Am. Murchisonæ, Hinnites abjectus, Ostrea costata, Terebratula perovalis, Rhynchonella sub-decorata, Montlivaltia De-la-Bechei*, &c.

At Combe Hill and Blackingrove limestone beds let in by faults (originally mapped however by the Geological Survey as "Northampton Sands") have been proved by Mr. Beesley to be undoubtedly Inferior Oolite. From the Combe Hill beds he has collected 65 species of fossils, most of which were determined by Mr. Etheridge, F.R.S. The collection includes a new *Trigonia*, which will be described by Dr. Lycett in his monograph on the *Trigoniadæ*.

The thickness of the Great Oolite cannot be measured, owing to faults. It is probably about 50 feet. The limestone is earthy, compact, white outside, and blue within. It is never a freestone, but occasionally contains hard shelly bands like Forest Marble, used for road-metal. The limestone at Tadmarton contains *Teleosaurus*

brevidens and *subulidens*, and the whole section (but chiefly the above and Constitution Hill) has yielded 129 species. The base when seen invariably rests on a grey laminated sandy marl, resting on the Northamptonshire Sands.

In making a new branch railway recently at Greatworth, the Great Oolite was found to be eroded and smoothed by glacial action, and filled with drift. The base is a blackish clay, with abundant decayed glacial shells, above is a grey sand with a few shells, overlaid by gravels, clays, and sands, with pebbles and lumps of hard chalk, Permian sandstone, *Ostrea dilatata*, and Marlstone, mostly scratched.

Mr. Beesley describes the faults traced in the Geol. Survey Map, and also a small one, parallel with Broughton fault, from Broughton road across the low ground between Constitution and Crouch Hills, with a downthrow north of 30 feet. C. E. De R.

REPORTS AND PROCEEDINGS.

Geological Society of London.—I.—March 20, 1872.—Prof. John Morris, Vice-President, in the Chair.—The following communication was read:—"On the Wealden as a Fluvio-lacustrine Formation, and on the relation of the so-called 'Punfield Formation' to the Wealden and Neocomian." By C. J. A. Meyer, Esq., F.G.S.

In this paper the author questioned the correctness of assigning the Wealden beds of the south-east of England to the delta of a single river; he considered it more probable that they are a fluvio-lacustrine rather than a fluvio-marine deposit, and attributed their accumulation to the combined action of several rivers flowing into a wide but shallow lake or inland sea. The evidence adduced in favour of these views was mainly as follows:—The quiet deposition of most of the sedimentary strata, the almost total absence of shingle, the prevalence of such species of Mollusca as delight in nearly quiet waters, the comparative absence of broken shells such as usually abound in tidal rivers, and the total absence of drift-wood perforated by Mollusca in either the Purbeck or Wealden strata.

This Wealden lacustrine area the author supposed to have originated in the slow and comparatively local subsidence of a portion of a land-surface just previously elevated. He considered that during the Purbeck and later portion of the Wealden era the waters of such lacustrine area had no direct communication with the ocean. The changes from freshwater to purely marine conditions, which are twice apparent in the Purbeck beds, and the final change from Wealden to Neocomian conditions at the close of the Wealden, were attributed to the sudden intrusion of oceanic waters into an area below sea-level.

The author then pointed to the traces of terrestrial vegetation in the Lower Greensand as evidence of the continuance of river-action after the close of the Wealden period.

In the concluding portion of his paper the author referred to the relation of the Punfield beds of Mr. Judd to the Neocomian and