sphere, which is small, and placed somewhat jauntily on one side. At one time it was in all probability much larger, and was then drawn farther down over our northern regions than it is at present; but so far as I have seen, many of the markings it may then have made can also be explained by more modest assumptions; whilst not only its tracks, but also of the allies it would have summoned into being, we yet need proof of their existence.

Various causes as at present have in past times been in action, and the results of one may often have obliterated those of others, which renders the tracing of phenomena to their origin a matter of difficulty, because our data are either antagonistic or else not sufficiently convergent in their character.

(*To be continued in our next Number.*)

NOTICES OF MEMOIRS.

I.—On the Discovery of a Land-plant in the Middle Portion of the Silurian Strata. By M. G. de Saporta. (Comptes Rendus de l'Académie des Sciences, tom. lxxxv. No. 10.)

THE discovery that I am about to announce to the Academy is quite new. On my journey to Caen, three days ago, I received from Prof. Morière, a slab, coming from the slaty-schists of Angers, and from the zone of *Calymene Tristani*, which furnishes evident traces of a tolerably large fern. The impression is in a fair state of preservation; the vegetable substance is replaced by sulphuret of iron, and many of the outlines are broken or torn, as if the plant had suffered from a long sojourn at the bottom of the waters. A long stem is distinguishable, along which the pinnules, attenuated towards their point of insertion, are attached by a subsessile base. The venation, composed of very fine veins, often dichotomous, without a median vein properly so called, places this fern amongst the *Neuropteridæ;* it calls to mind the genera *Cyclopteris* and *Palæopteris* in the Upper Devonian or Lower Carboniferous series; but the species I now record cannot be confounded with any of those hitherto described. The Silurian of Europe having as yet, in point of vegetable remains, only furnished some Algæ of a doubtful character, we may conclude this fern from the slaty-schists of Angers to be the oldest terrestrial plant that has been met with on our continent. The existence of the family of ferns is thus carried back to a period more remote than one would have supposed. The origin itself of vegetation will be thrown back far beyond the Silurian, since the fern from Angers, by reason of its affinity with the Carboniferous *Neuropteris*, seems to indicate a flora already relatively rich and complex, and far removed from the beginning of plants, and the first apparition of life.

I should add that the learned Leo Lesquereux, who, in America, pursues his researches on the plants of the Carboniferous and Palæozoic epochs, assured me, three or four months ago, that he had collected on his side, terrestrial plants, and particularly ferns,

very rarely it is true, from near the base of the Silurian strata. These observations agree with those I have just offered to the Academy, and support the conclusions to which I have arrived. I only wish to establish in favour of M. Lesquereux the right of priority which no one will dispute with him. B. B. W.

II.—Descrizione degli strati Pliocenica dei dintorni di Siena. By Prof. Carlo Stefani. (Bolletino del R. Comitato Geologico, August, 1877.)

IN the August number of the Bolletino del R. Comitato Geologico Prof. Carlo Stefani completes the "Descrizione degli strati Pliocenica dei dintorni di Siena," which was begun in the previous number. Targioni, Soldani, Pareto, Mortillet, Capellini, and many other Italians and foreigners, who have made a study of the Tertiaries, have described this district, which makes a detailed description and discussion of the geology of this classical spot, brought up to the present stand-point of the science, doubly important. The beds in the immediate neighbourhood are Pliocene, apparently lower and middle, consisting of alternations of marine and brackish-water strata, with fresh-water only in one place, and these changes the author ascribes to the amount of sea-water which could enter into a gulf of the sea in this locality.

The great development of the Pliocene in Italy and contemporaneous deposits having taken place in such different circumstances, as in deep-sea, littoral, brackish, and fresh-water conditions, it is not unnatural that many divisions of this period have been made which will have to fall under more exact examination, and in the Siena beds Prof. Stefani shows that the geological phenomena become simpler when the contemporaneity of the various deposits is understood. Long lists of fossils are given for comparison, and a complete catalogue from the pen of a colleague is promised shortly. These beds, it is unnecessary to say, are very fossiliferous.

The laborious communications that are constantly appearing in this Bolletino on the interesting Miocene and Pliocene formations of Italy are gradually placing before us the recent geology of this country with great clearness. A. W. W.

III.—Abstract of a Paper on the Carboniferous Limestone and Millstone-grit in the Country around Llangollen, North Wales. By George H. Morton, F.R.S.

[Read at the Meeting of the British Association, Plymouth, August 20th, 1877.]

THE author described the Carboniferous Limestone exposed in the Eglwyseg ridge near Llangollen. He stated that the finest section is exposed at the Ty-nant ravine, on the west of Cefn-y-Fedw, and that the country must be considered as the typical area of the Lower Carboniferous series in North Wales. The Millstone-grit, or Cefn-y-Fedw Sandstone, which reposes on the limestone, in the same district was also described. The following tabulation explains the succession and thickness of the entire series.

TABULAR VIEW OF THE CARBONIFEROUS LIMESTONE AND CEFN-Y-FEDW SANDSTONE IN THE COUNTY AROUND LLANGOLLEN.

		Feet.	
CEFN-Y-FEDW SANDSTONE.	Aqueduct Grit, or Upper Sandstone and Conglomerate	70	Upper Cefn-y-Fedw, Dee Bridge, or Millstone-grit Series.
	Upper Shale	30	
	Dee Bridge Sandstone	30	
	Lower Shale with Fire-clay and bands of Limestone	18	Middle and Lower Cefn-y-Fedw, or Yoredale Series.
	Middle Sandstone	200	
	Cherty Shale	50	
	Lower Sandstone and Conglomerate	250	
	Sandy Limestone	75	
CARBONIFEROUS LIMESTONE.	Upper Grey Limestone	300	Upper Carboniferous Limestone.
	,, White ,,	300	
	Lower ,, ,,	120	Lower ditto.
	,, Brown ,,	480	
		1923	

Upper Old Red Sandstone ..... 300 feet.

Each of the subdivisions was separately described, and a section from the Ty-nant ravine to Tyfyn-uchaf was exhibited, showing the regular succession of the whole of the strata from the Old Red Sandstone to the Coal-measures. The following table shows the gradual attenuation of the Carboniferous Limestone towards the south-east.

SUBDIVISIONS.	Ty-nant.	Tan-y-Castell.	Trevor Rocks.	Bronheulog.	Fron.
Upper Grey Limestone	300	300	250	66*	88*
,, White ,,	300	250	140	99	27†
Lower ,, ,,	120	115	117	104	.....
,, Brown ,,	480	360	100‡	26‡	.....
	1200	1025	607	295	115

* Upper portion has been denuded.
† Reposes on the Wenlock Shale.
‡ Lowest beds not ascertained with certainty.

This section shows how the limestone diminishes in thickness with the rise of the Wenlock Shale towards the south-east. Between the Ty-nant ravine and Fron, four miles from the former place, the attenuation is not less than 900 feet.

The list of fossils collected by the author contained seventy-seven species. Of these fifty-eight occur in the Upper Grey Limestone, and only eighteen in the Lower Brown Limestone. If the Carboniferous Limestone is simply divided into Upper and Lower Limestone, thirty-eight species are peculiar to the two upper subdivisions, and nineteen to the two lower subdivisions; twenty species being common to both. However, the species are by no means confined to the subdivisions in which they are found near Llangollen, for they occur at different horizons in other districts.

IV.—British Association for the Advancement of Science, Forty-seventh Meeting, Plymouth, August 16th, 1877. Titles of Papers Read in Section C. (Geology).

President.—W. Pengelly, Esq., F.R.S., F.G.S.

President's Address. (See p. 419.)

The President.—Sketch of the Geology of the Coast from the Rame Head to the Bolt Tail.

J. H. Collins.—On the Drift of Plymouth Hoe.

R. N. Worth.—Notes on the Palæontology of Plymouth.

Professor G. Dewalque.—On the Devonian System in England and in Belgium.

A. Champernowne, M.A.—On the Succession of the Palæozoic Deposits of South Devon.

S. R. Pattison.—On the Carboniferous Coast-Line of North Cornwall.

C. Reid.—On the Junction of the Limestone and Culm-measures near Chudleigh. (See p. 454.)

H. B. Woodward.—Notes on the Devonian Rocks near Newton Abbot and Torquay, with Remarks on the Subject of their Classification. (See p. 447.)

W. Pengelly, F.R.S.—Thirteenth Annual Report of the Committee for assisting in the Exploration of Kent's Cavern.

R. H. Tiddeman, M.A., F.G.S.—Fifth Annual Report of the Committee for assisting in the Exploration of the Settle Caves (Victoria Cave).

C. De Rance, F.G.S.—Report of the Committee for investigating the Circulation of Underground Waters in the New Red Sandstone and Permian formations.

C. Le Neve Foster, D.Sc., F.G.S.—On some Tin Mines in the parish of Wendron, Cornwall.

C. Le Neve Foster, D.Sc., F.G.S.—On the "Great Flat Lode" South of Redruth and Camborne.

C. Le Neve Foster, D.Sc.—On some of the Stockworks of Cornwall.

Arthur W. Waters, F.G.S.—Influence of the Distribution of Land and Water upon the Shifting of the Axis of the Earth.

J. H. Collins, F.G.S.—Note on the Serpentine of Duporth in St. Austell Bay, Cornwall.

Professor J. W. Clarke.—Some Observations upon the Origin and Antiquity of the Mounds of Arkansas, United States.

Professor A. S. Herschel, M.A., F.R.A.S., and *G. A. Lebour, F.G.S.*—Report on the Thermal Conductivities of Rocks.

Rev. H. W. Crosskey, F.G.S.—Report of the Boulder Committee.

J. Gwyn Jeffreys, LL.D., F.R.S.—On the Post-Tertiary Fossils procured in the late Arctic Expedition, with Notes on some of the Recent or Living Mollusca from the same Expedition.

C. E. De Rance, F.G.S.—Note on the Correlation of certain Post-Glacial Deposits in West Lancashire.

G. H. Morton, F.G.S.—On the Carboniferous Limestone and Millstone-grit in the Country around Llangollen, North Wales. (See p. 469.)

G. A. Lebour, F.G.S.—On some Pebbles in Shales.

W. Gunn, F.G.S.—A Short Sketch of the finding of Silurian Rocks in Teesdale.

W. Molyneux, F.G.S.—On the Occurrence of *Aviculopecten* and other Marine Shells in Deposits associated with Seams of Coal, containing Salt Water, in the Ashby Coal-field.

H. C. Sorby, F.G.S.—On a New Method for Studying the Optical Characters of Minerals.

Rev. Professor Heer.—Note on the Fossil Flora of the Arctic Regions.

H. Woodward, F.R.S.—On the Discovery of *Branchipus* in a fossil state in the Eocene Limestone (Freshwater) of Gurnet Bay, Isle of Wight.

G. A. Lebour. F.G.S.—On the Age of the Cheviots.

R. A. C. Godwin-Austen, F.R.S.—On the Geological Significance of the Boring at Messrs. Meux's Brewery, London. (See p. 474.)

Thomas Plunkett.—Cave Exploration in Fermanagh.

Dr. J. S. Phené.—On some peculiar Stalactitic Formations from the Island of Antiparos.

A. J. Mott.—On the Source and Function of Carbon in the Crust of the Earth.

REVIEWS.

I.—The American Palæozoic Fossils. A Catalogue of the Genera and Species; with an Introduction devoted to the Stratigraphical Geology of the Palæozoic Rocks. By S. A. Miller. (Cincinnati, Ohio, 1877.)

THE constant additions to the number of fossil species, and their publication in different memoirs and various kinds of periodicals, renders it very difficult for the student of palæontology to ascertain where to find them described or noticed.

Under this point of view, carefully prepared catalogues are of considerable use and convenience, whether as merely including the species of a genus, or that of a larger group, as the Catalogue of the Crustacea by Mr. H. Woodward noticed in this Magazine (Sept. p. 413), or as embodying the entire fauna of a single geological formation, or of a series of strata, as in the Catalogue which is the object of this brief notice.

The student of Palæozoic fossils will find in this volume a record of the numerous remains of the North American Palæozoic fauna and flora, which have of late years been the subject of numerous valuable memoirs by the indefatigable palæontologists of that country.

The main body of the work, which of course comprises the catalogue of species, is preceded by the preface, in which the author states the general plan upon which the Catalogue is based. Some notion of the extent of the work and consequent labour attending it may be gleaned from the fact that the total number of genera and species, including the synonyms, is 11,200, comprising 1000 genera and 2000 species; the number 2200 are names of genera and species which are considered to be synonyms of the others.

A chapter is devoted to the construction of systematic names in palæontology by Prof. Claypole, containing some useful remarks,