

The majority of those in the first class are on a level with the water, whilst the remainder are elevated above, varying from a few to upwards of sixty feet.

In the second class the level varies, but nearly all are above that of the sea, and, as will presently be described, none penetrate the earth to a considerable depth; but this may be found to be otherwise as the explorations are continued. In none have animal remains been found, excepting in one instance, and they were discovered loose and not imbedded in stalagmite; and so far as I am aware, not a single object, such as a flint arrow-head or spear, used by the ancient inhabitants of the country, has been observed. This circumstance may in some measure detract from the present communication; that part of the inquiry has still to be worked out, as many of the caverns have been but very partially explored, indeed some have scarcely been examined and as several of them branch off by means of fissures and galleries, running from distinct chambers (most of the latter containing stalagmite) we may yet hope for interesting discoveries, particularly in that district of country in which exist the huge caverns of Mono and Eramosa in the Niagara limestone rocks of the Upper Silurian formation. The researches of my friend, Mr. Sterry Hunt, of the Canadian Geological Survey, have shown that these limestones are essentially dolomitic, and thus perhaps favourably constituted for the development of caverns.

(To be continued.)

PROCEEDINGS OF GEOLOGICAL SOCIETIES.

GEOLOGICAL SOCIETY OF LONDON, *February 29, 1860.*—L. Horner, Esq., President, in the Chair.

“On the Lower Lias of the South of England.” By Dr. T. Wright, F.G.S.

The author first stated that the uppermost beds of the Lower Lias are those containing *Hippopodium ponderosum*, and that the lowest beds are those with *Ammonites Planorbis*, overlying a series of strata containing *Etheria*, &c., which he separates from the Lias, under the name of the *Avicula contorta* beds. The last rest on the grey and red marls of the Keuper.

Dr. Wright then proceeded with the description of the *A. contorta* beds, including the “Bone-bed,” having first enumerated the authors who have written on these and the equivalent strata (Kössener, Shichten, etc.) on the Continent. The sections at Garden Cliff, near Westbury on the Severn, at Wainlode Cliff, at Aust Cliff, at Penarth, near Cardiff, at Uphill near Weston-super-Mare, at Culverhole near Axmouth, at Wilmcote and Binton near Stratford-on-Avon, were described in detail as illustrating this series; and General Portlock’s section of these beds in the North of Ireland was also alluded to. *Pecten*

Valoniensis, *Cardium Rheticum*, and *Avicula contorta* are the chief molluscan fossils of this zone.

The next group of strata are those with *Ammonites Planorbis* and *Am. Johnstoni*. Some of the foregoing sections expose these beds, such as those at Uphill and Wilmcote; but they can be still better studied at Street in Somersetshire, where they have yielded so many fine Enaliosaurian fossils. These beds are also well exposed at Bockeridge and Defford in the Vale of Gloucester, and at Binton in Warwickshire.

Isastræa Murchisonæ occurs in this zone, and *Ostrea Liassica* is very characteristic of some of its lower beds. *Ichthyosauri* and *Pleniosauri* of several species are found in this series; the latter chiefly in the lower part. Of the two known specimens of the *Pl. megacephalus*, one was found in these beds near Street, Somerset, and the other at Wilmcote, Warwickshire.

The *Ammonites Bucklandi* characterizes the next higher group of strata, which are also known as the Lima-beds. These are well seen at Lyme Regis, at the Church Cliff, and from the Broad Ledge to the shore, and yield several species of *Ichthyosaurus*, also *Am. Conybeari*, *A. rotiformis*, *A. angulatus*, *A. Greenoughii*, and *A. tortilis*.

The *Am. Turneri* beds are next, and can also be studied at Lyme Regis; they have yielded three species of *Ichthyosaurus*. *Am. semicostatus* and *A. Bonnardi* belong to this zone.

The *Am. obtusus* beds succeed, between the Broad Ledge at Lyme and Cornstone Ledge near Charmouth; they apparently have no saurian fossils. *A. Brooki*, *A. stellaris*, *A. planicosta*, and *A. Duddesi* accompany *A. obtusus*.

The next zone is that of the *Am. oxynotus*, with *A. bifer* and *A. lacunatus*. The beds with *Am. raricostatus* comprise, in ascending order, the Ammonite-bed, the Hippopodium-bed, the coral-band, and the Gryphæa-bed. This zone is well seen near Cheltenham, at Lyme, and at Robin's Hood Bay in Yorkshire. *Am. armatus*, *A. nodulosus*, and *A. Guidalianus* belong to the *A. raricostatus* beds.

Dr. Wright then pointed out that the *Avicula contorta* beds, like the Kössen beds, contain a fauna special to themselves, and might as well be classed with the Trias as with the Lias. They have a wide range in the South of England, South Wales, the Midland Counties, and the North of Ireland. After some remarks on the more important features of the several Ammonite-zones of the Lower Lias, the author concluded by remarking that as Quenstedt and Opel had observed, the Middle Lias could be similarly subdivided by means of the Ammonites peculiar to its several stages.

LIVERPOOL GEOLOGICAL SOCIETY, March 13, 1860.—Thomas Urquhart, Esq., in the Chair.

The Secretary, G. H. Morton, Esq., F.G.S., exhibited a number of scratched boulders, and shells of several species collected by him from the boulder-clay of the district. He showed how the boulders were connected with the grooved and striated surfaces of the sandstone in the neighbourhood.

Thomas I. Moore, Esq., of the Derby Museum, exhibited Cetacean remains from more recent local deposits.

The Rev. Henry H. Higgins brought forward his proposal for the arrangement of the recent and fossil species, in the new Liverpool museum, in natural history series, without regard to stratigraphical formations. The Secretary, Dr. Collingwood, and most of the members of the society, advised a geological arrangement of the fossils. It was suggested that the Society should enrich the valuable geological collection of the Royal Institution, which, with some small additions, would assume considerable importance.

MANCHESTER GEOLOGICAL SOCIETY, *February 16.*—On this day the members of this Society made an excursion to Burnley, under the direction of the President, Sir James Kay Shuttleworth, Bart., F.G.S. After the dinner, the President described the valuable seams of coal under the Gawthorpe estate, and Mr. Pickup described the strata at the pit belonging to Messrs Thursby and Scarlett at Spa Clough. Mr. Binney drew attention to the bed of *Unio robustus* as being two hundred yards above the Habergham, or assumed Arley mine of Full-edge; whilst at Wigan the same bed was only forty-seven yards above the Arley-mine. In the dining-room were displayed Mr. Wilds' excellent collection of fossil fish-remains from Full-edge, and shells from the Lower Coal-measures, as also extensive and valuable collections of fossil plants from the Burnley Coal-field belonging to Messrs Whittaker and Birtwell. Mr. J. Mushen of Birmingham exhibited some beautiful casts of cystideans.

Ordinary Monthly Meeting, February 28.—A paper was read on "Over-Winding in Coal and other Mines," by Thos. Wynne, Esq., F.G.S.

NOTES AND QUERIES.

MR. PAGE'S HANDBOOK OF GEOLOGICAL TERMS.—We have received a considerable number of communications upon various points of pronunciation. We have reserved these for a time, with a view to their publication together in our next number. We hope, therefore, that any intended suggestions or remarks may be forwarded to us early in the present month.

LIMESTONE VEINS IN SHALE AT THE BASE OF THE OLD RED SANDSTONE.—SIR,—A few days since I observed some irregular vertical veins, or thin dykes of dark grey compact limestone, crossing a nearly horizontal bed of red shale in and near the local base of the Old Red Sandstone, which rests unconformably upon beds very seldom, and then but slightly calcareous. The shale in which they were observed is separated from the overlying Carboniferous Limestone by a considerable thickness of yellowish sandstone, of which over two hundred feet is exposed. As these veins do not contain fossils, and there is nothing else to show that the limestone was derived from organic sources, while the thickness of the intervening sandstone is against the supposition that it was deposited by infiltration from the Carboniferous Limestone. Perhaps you, or some of your other readers will say how an occurrence so unusual may be accounted for.—I am, etc., A. B. W., Templemore.

BIBLICAL CHRONOLOGY OF MAN.—SIR,—In reference to the *vezata questio* of the age of man on the earth as connected with the works of human art lately found in France, one point of consequence has, I think, been hitherto overlooked, viz., that we are not confined by the authority of the Bible to the period of six thousand years for the date of man's creation upon the earth. Phyres Clinton, in the appendix to his "Fasti Hellenici," mentions the fact that most of our old Bible manuscripts vary much in their chronology, chiefly in the duration of life assigned to the patriarchs before the Flood, and also before the time of Abraham. So considerable is this variation that I believe I am not far wrong in stating that twelve thousand, or even twenty thousand years