

The lower part of the Lias and the Rhætic beds are entirely concealed; but grey marls overlying red marls occur about half a mile east of Clifton Station, and at the station the Red Marl of the Keuper comes on in force. The alluvial deposits of the Trent, pierced to a depth of from 25 to 30 feet, consist principally of loam overlying varying thicknesses of sand and gravel. Horns of red deer were found at a depth of 25 feet. At Dukeries Station white flaggy Keuper sandstones appear from beneath the Red Marl, and probably represent the eastward extension of the Tuxford Stone. A deep well here has been bored to a depth of 644 feet from the present surface, and details of the section are given in the paper. South of Kirton there is a deep cutting in the Waterstones, and after leaving the escarpment the line enters on the great dip-slope of the Bunter Pebble Beds, which are shown at Ollerton and at intervals for four miles beyond this. There are no sections in the Lower Red and Mottled Sandstones; and west of Warsop the line crosses the dip-slope of the Magnesian Limestone. Details of the sections in this rock are given.

Between Scarcliff and Bolsover the line crosses the Permian escarpment in a tunnel, the whole of which is in the Coal-measures; these are high up in the series, and contain no coal-seams of value. They are not stained red.

West of Arkwright's Town Station is a very complete section of beds representing the Middle Coal and Ironstone series (the most valuable part of the Derbyshire Coalfield), of which full details are given, most of the important coal-seams being readily recognized; and the author describes some remarkable features in the relationships of some of the sandstones to the other deposits.

The absence of Glacial beds is of much interest; not a trace of genuine Boulder-clay has been seen along the whole line.

OBITUARY.

GEORGE HARRY PIPER, F.G.S.

BORN APRIL 8, 1819.

DIED AUGUST 26, 1897.

THE subject of this brief notice, the second son of the late Captain E. J. Piper, R.N., was born in London in 1819, in the neighbourhood of Regent's Park, where his family resided. His parents removed to Herefordshire in 1829, taking their son George, then a boy of ten years old, with them. Naturally an observant youth, country life and pursuits, after London, had a great attraction for him, and he speedily became interested in studying the birds, trees, and flowers, and early learned to fish and shoot. When only fourteen, however, his health gave way, and he had to remain in bed for about three years, suffering from a lame leg, and was never entirely free from pain during the remainder of his life. As a consequence of this, his education was carried on at home, in a more or less desultory manner. Nevertheless, he was a keen

scholar, and at about eighteen years of age he was duly articled to the late Mr. Thomas Jones, Attorney of Ledbury; and having served his master and duly passed his examinations in law, he was admitted as a Solicitor in 1849, and from that time commenced to practise in Ledbury, where he continued in his profession until his death. He was joined in partnership by Mr. C. E. Lilley in 1886, and was one of the oldest solicitors in the county. In addition to his private practice he also held appointments as Commissioner to Administer Oaths, Perpetual Commissioner, etc., Deputy-Registrar, and in 1865 Registrar, of the County Court and High Bailiff of the Court, which offices he held up to the time of his death.

Mr. Piper took a keen interest in the progress and work of the Horticultural and Natural History Societies of the County of Hereford, and had filled the position of President both of the Woolhope Naturalists' Field Club and the Malvern Naturalists' Field Club. To these Societies he communicated many papers, and with them he did much excellent work in botany, local archæology, and geology, more especially in the latter field of research.

Mr. Piper's geological work was carried on for years in association with the late Rev. W. S. Symonds, M.A., F.G.S., of Pendock Rectory, Tewkesbury; Dr. Bull of Hereford; the Rev. P. B. Brodie, M.A., F.G.S., and other enthusiastic workers.

The greatest geological achievement performed by Mr. Piper was the carrying out successfully, after many years of patient exploration, the complete examination and recording, foot by foot, of the famous section near the railway tunnel at Ledbury, comprising the series of deposits from the Aymestry Limestone, through the Upper Ludlow rocks; the Downton Sandstone, with *Pterygotus*; the Ledbury shales, consisting of red, grey, purple shales, and grey marl-beds, with *Pteraspis*, *Auchenaspis*, *Cephalaspis*, *Onchus*, *Pterygotus*, *Lingula cornea*, etc.; followed by Lower Old Red Sandstone, with *Pterygotus*, *Pteraspis*, and *Cephalaspis*, etc.

In Mr. Symonds' paper "On the Old Red of Herefordshire" he writes of the Passage-Beds at Ledbury: "Having again visited Ludlow, and compared the Passage-beds of that district with those of Ledbury, I am convinced that nowhere perhaps in the world is there such an exhibition of Passage-beds presented to the eye of the geologist as at the Ledbury Tunnel on the Worcester and Hereford Railway." See H. Woodward's "Brit. Foss. Crustacea" (*Merostomata*): Pal. Soc., part iii, 1871, p. 99.

The rich collection of fossils which Mr. Piper formed from the Ledbury Tunnel Section, and from other localities in the neighbourhood, will, it is believed, shortly find a home in the British Museum (Natural History), Cromwell Road, where so many of his fine Cephalaspidian fishes have already been presented in past years, including the superb group of twelve individuals of *Cephalaspis Murchisoni*, preserved in one block of Old Red Sandstone—forming Plate x in Mr. Arthur Smith Woodward's Catalogue of Fossil Fishes in the British Museum (Natural History), Part ii, 1891, p. 189—

from the Passage-beds, Ledbury, presented by Mr. George H. Piper in 1889.

Mr. Piper was elected a Fellow of the Geological Society of London in 1874, but his numerous scientific papers will mostly be found in the Transactions of the Woolhope Club.

He was for many years local Hon. Secretary of the Royal Agricultural Benevolent Institution, and took a deep interest in all matters relating to agriculture, and especially the cultivation of fruit and of roses.

He largely assisted in the publication of "The Herefordshire Pomona," and was with the late Dr. Bull selected to visit Normandy to inquire into the subject of fruit-culture there and to exhibit Herefordshire fruit. These gentlemen returned with several prizes awarded at the Rouen Exhibition for fruit grown in their own county.

It would be impossible here to convey a just idea of the large and varied fields of scientific activity and social benevolence to which Mr. George Piper devoted his long and useful life; but the testimony of respect shown for him by his fellow-townsmen of *all classes* at his funeral might be cited as good evidence that he had not lived in vain. He was not only highly accomplished in many literary and scientific fields of inquiry, but "he was known to all as a genial, upright, and courteous gentleman, whose life was not spent for himself alone, but most largely for the good of others. In him the inhabitants of Ledbury and its neighbourhood have lost an able lawyer and a much respected friend." (From Mr. F. Russell's speech in Ledbury County Court.)

MISCELLANEOUS.

A BIBLIOGRAPHY OF NORFOLK GLACIOLOGY, INCLUDING THE CROMER CLIFFS, WITH THE FOREST-BED SERIES. By W. JEROME HARRISON, F.G.S. (Reprinted from the *Glacialists' Magazine* for March, June, and September, 1897.)—This work of 91 pages contains all the titles and brief abstracts of most of the papers dealing with the Cromer Forest-bed and the Glacial Drifts of Norfolk, published between 1745 and 1897. To workers on East-Anglian geology this will henceforth be an indispensable work of reference, and all will feel greatly indebted to Mr. Harrison for the labour and care bestowed on the work. Two years ago he prepared a similar work on Midland Glaciology.

A BIBLIOGRAPHY relating to the Geology, Palæontology, and Mineral Resources of California, has been compiled by Captain Anthony W. Vogdes (California State Mining Bureau, Bulletin No. 10). This is arranged, not chronologically, but according to the several sources of publication; there are some explanatory notes and there is a good index. The list includes works published up to 1896.