

interest from the evidence there of the relation of these animals and man to the great ice-sheet. This hyæna-bed dips into the cave, and has been worked only a short distance from its mouth; but at the mouth itself, vertically under the farthest projection of the overhanging cliff, lies a bed of stiff glacial clay containing ice-scratched boulders. This bed dips outwards at an angle of about 40°, and evidently lies on the edges of the beds containing man and the older mammals. It has been suggested that it may have fallen from the cliff above, and therefore may not necessarily have come into its position in glacial times, but, on a careful consideration, this is quite impossible. Upon it lies a great thickness of talus or scree, which is made up of fragments of limestone split off from the cliff above by the frosts of successive winters. If all this were now removed it would be barely possible for the glacial drift to fall from the cliff above to its present position, but if all the talus were restored to the cliff, of which it forms the waste, such a fall would be impossible. It is quite clear, from the waste of the cliffs which has taken place since the glacial drift came where it now lies, that the cliff then projected many feet farther out and would prevent such a fall.

A strong argument lies also in the fact that the loose talus all lies above the drift and is quite free from mud, whereas all the deposits below it are heavily charged with it, and the mud is just such a fine impalpable stiff mud as would result from the grinding of glaciers and the flow of glacier water. It seems probable that the drift is really the remnant of a moraine lateral or *profonde*, left here by a glacier or an ice-sheet, and that the remains of the older mammals and of man disinterred from beneath it are of an age at any rate previous to the great ice-sheet of the Irish Sea basin. But there is another line of argument which tends to the same conclusion. Three years ago it was believed by most geologists that the fauna here disinterred had never existed in this particular area—and why? because their remains had never been found in any of the river deposits of the district. It was supposed that the great extension of the ice prevented their migration hither. It is clear, now that we have found these remains in caves, that they must have peopled the northern district at one time as thickly as they did the south of England, where their bones are so common in river gravel. But their remains in the northern district occur now only in caverns, and have been removed from the open country. When we compare this removal of the mammoth-fauna over certain districts with the presence of evidence of land glaciation on a great scale, we begin to see that they bear a definite relation to one another, and that the ice-sheet was the great “besom of destruction” which swept away all remains of the older inhabitants from those portions of the country adjacent to the great ice centres.*

Again, there is another matter relating to this question which has hardly received the attention which it deserves. This is the complete absence of palæolithic implements and the fauna which is usually associated with them in the river gravels of the south, over co-extensive areas of the north of England, indicating the removal of palæolithic man from those areas by the ice-sheet. If I am not much mistaken, this discovery at Settle may have an important bearing in several ways. It will carry back the proofs of the antiquity of man to a time previous to the ice-sheet, that is to interglacial if not to preglacial times. It will corroborate the opinions expressed by Mr. Godwin Austen, Mr. James Geikie, and others, that the older valley gravels of the south of England are not of an age subsequent to the Till of the North. And it will give some support to the views of Messrs. Searles Wood and Harmer, that the Till of the north-west of England, though older than the great submergence, is probably of younger date than the greater part of the drifts of the east coast.

* *Geological Magazine*, vol. x. p. 140.

The Cave Committee will continue their work with redoubled vigour. It is much to be hoped that the scientific public will come to their assistance, and not let the expense of the undertaking fall, as now, almost entirely on the district of Craven.†

R. H. TIDDEMAN

ATLANTIC FAUNA

LAST May the s.s. *Hibernia* belonging to the Telegraph Construction and Maintenance Company, was despatched to repair the French Atlantic Cable, in which a fault was indicated some 200 miles from Brest. A brief account of some of the animal forms obtained by me in that expedition may not be without interest to some of the readers of NATURE.

To Mr. R. London, superintending the expedition, I am greatly indebted for the many facilities that he afforded me, of obtaining specimens of the deep-sea fauna. The first cast was made about 100 miles nearly due west of Brest, at a depth of 83 fathoms. Here we found numerous valves of *Pecten*, a fine *Ophiocoma*, with rays nine inches in length, which when handled broke itself into numerous fragments, *Echinus lividus*, *Spatangus purpureus*, &c.

At the surface we obtained by means of a towing-net a great abundance of a minute Entomostracous crustacean of a greenish-blue colour, with deep sapphire eyes, a *Cydippe*, two species of *Idotea* and *Polybius Henslowii*.

On the Atlantic cable, which was raised to the surface at a point 112 miles west of Brest, were found numerous shells of a small boring mollusc, one of the *Pholadidæ*, apparently *Xylophaga*. The outer covering of the cable, consisting of tarred manilla hemp, was perforated in many places by the round holes which they had formed and in which their shells were found. In places they had penetrated the outer covering, and had passed between the iron wires to the gutta percha core, in which they had made numerous shallow indentations, but in no case had they penetrated this to any depth. This cable, it will be remembered, was laid in 1869.

We now steamed about 87 miles westward to the edge of the Little Sole Banks, where the water deepens from 90 to 480 fathoms within a distance of a few miles. Here the cable was again hooked and brought to the surface from a depth of about 300 fathoms. Adhering to its surface was a species of *Pycnogonum* in great abundance. The specimens lived for some time after being brought to the surface, and moved about sluggishly.

A few bright red anomalous crustaceans were also obtained. These were very active, and lived for some days in a bucket of water.

They had, while in confinement, a peculiar habit of drawing their claws over their head, antennæ, and eyes, which suggested the idea that they were confused and dazzled by the extraordinary amount of light to which they were exposed.

A species of *Tubularia* of great beauty grew abundantly in clusters on the cable, and thrived well in confinement. The cable was thickly overgrown with *Sertularias* of various species, moored to which by their hinder legs a species of *Caprella*, diabolic in appearance, but sluggish and inactive in nature, abounded.

A few miles farther westward the cable was raised from a depth of 480 fathoms. *Sertularias*, *Tubularias*, *Caprella*, &c., were still abundant; but the *Pycnogonum* was conspicuous from its absence.

In the recent expedition in which the *Great Eastern* and *Hibernia* have been employed in endeavouring to repair the Atlantic Cable of 1865, the natural history results have been much more meagre. Perhaps the most interesting objects obtained are some fragments of rock,

† Messrs. Birkbeck and Co., Craven Bank, Settle, have kindly consented to receive subscriptions.

consisting of Hornblende with interspersed crystals of quartz, found in lat. $51^{\circ} 56' N.$, long. $35^{\circ} 45' W.$, at a depth of about 1,760 fathoms.

FRED. P. JOHNSON

NOTES

PROF. SYLVESTER has recently made a discovery which is likely to create some interest, not only amongst mathematicians, but also amongst mechanics and instrument-makers. By means of a sort of lazy tongs he has succeeded in converting spherical motion into plane motion, a result, we believe, hitherto looked upon as unattainable. This discovery will form the subject of a communication which Mr. Sylvester is announced to lay before the London Mathematical Society at its Annual General Meeting on Thursday next (November 13).

THE two gentlemen recently elected to Science-Fellowships at Oxford, are remarkable instances of success attending most irregular and unusual undergraduate careers. Mr. Yule was at one time a boy at Magdalen College School, he obtained the Brackenbury Scholarship for Physical Science at Balliol College, but was obliged to throw it up after a short time, on account of his failure to pass the classical examinations of the University. He bethought him of the more merciful ordinances of the sister University, and having obtained a Scholarship at St. John's College, Cambridge, proceeded on his undergraduate course unchecked by the lessened barrier of the previous examination. After being placed senior in the Natural Sciences Tripos, he returns to Oxford, we may hope bringing treasures from the East—and at any rate ready to use his vote for the improvement of the Oxford Examination Statutes. Mr. Macdonald is an individual who has come as near as is possible to achieving the feat of being in two places at one time. In fact, theoretically, he has been in two places at one time. He had the great courage and energy whilst holding a position in the Education Office, to enter as an Undergraduate at Merton College, and by consent of the College authorities he kept his term by sleeping in Oxford, which place he left every morning during term, so as to be at his official post, returning in the evening in time for hall dinner. His office-holidays he employed in practical work in the Oxford laboratories, whilst analytical chemistry had to be studied in his own sitting-room, converted for the time into a workshop. Such a history makes it very certain that the examination system has not failed at Merton College to secure at any rate a most worthy recipient of the fellowship.

THE election to the two vacant Fellowships at Merton College, took place on Oct. 30, when the choice of the electors fell upon Mr. John Wesley Russell, Lecturer of Balliol College, as Mathematical Fellow; and Mr. Archibald Simon Lang Macdonald, Commoner of Merton College, as Natural Science Fellow. Mr. Russell was placed in the first class in Mathematics under Moderators, in Trinity Term, 1871; and Mr. Macdonald in the first class in Natural Science at the final examination, in Michaelmas Term, 1871.

WE are glad to be able to add St. John's College, Cambridge, to the list of those which have opened their Fellowships to Students of Natural Science. Since 1868, the College has given Exhibitions yearly, and Foundation Scholarships since 1870, for the encouragement of a knowledge of Physics, Chemistry, and Biology. On Monday last the Master and Seniors, in proof of their desire to place the Natural Sciences on the same footing as Classics and Mathematics, elected one of their scholars, Mr. A. H. Garrod, B.A., who was a Senior in the Natural Science Tripos of 1871, to a Fellowship.

ABOUT the end of January 1874, there will be an election to a scholarship in Natural Science at Exeter College, Oxford, can-

didates for which will be examined in biology, chemistry, and physics. Candidates are not expected to exhibit *special* knowledge of more than one of the above subjects, and preference will be given to a candidate who excels in biology, or one of its branches. The candidate selected will have to satisfy the college that he has sufficient classical and mathematical knowledge to pass responsions. There is no limit of age disqualifying candidates for this scholarship. The scholarship is of the annual value of *80l.*, tenable for five years from matriculation. The scholar elected will have the use, during term, of a place in the histological laboratory of the college. For further information application should be made to Mr. E. Ray Lankester, Natural Science Lecturer, Exeter College.

MR. CHARLES J. F. YULE, of St. John's College, Cambridge, wishes us to state that he is not "the Cambridge B.A." whose letter appeared in last week's number.

AT the Commitia, held on Thursday, October 30, at the Royal College of Physicians, Dr. Robert Druitt was elected a Fellow of the College. The president announced that the Harveian Oration in the ensuing year would be delivered by Dr. Charles West. The Gulstonian Lectures will be delivered by Dr. J. F. Payne; the Croonian Lectures by Dr. Murchison; the Lumleian by Dr. Sibson.

WE regret to record the death, on Oct. 24, of Dr. Grace Calvert, F.R.S., F.C.S. The illness which caused it was contracted at Vienna, whither he had gone to act as juror in the International Exhibition. The *Journal of the Society of Arts* furnishes some particulars concerning the work of Dr. Calvert. As an analytical chemist his renown was European. He left England as a youth to pursue his education in France, and in the schools of that country secured many honours by the awards which he obtained. He subsequently pursued the study of chemistry, and was appointed assistant chemist at the Gobelins works, under his learned master, Chevreul. Soon after his return to England, he commenced reading a series of papers before the Society of Arts on chemistry applied to industry. At a later date, when the Society of Arts proposed to establish Cantor lectures, he gave the proposition his hearty support, and delivered two courses of lectures on "Chemistry applied to the Arts." He also delivered courses on "Synthesis and the Production of Organic Substances," on "Aniline and Coal Tar Colours," and on "Dyes and Dye-stuffs other than Aniline." In 1846 he settled in Manchester, and was soon after appointed Professor of Chemistry at the Royal Institution there. He was also for some time a lecturer at the Manchester School of Medicine. His connection with the Manchester Sanitary Association led him to hygienic investigations—one of the principal results of which was a patent for the application and preparation of carbolic acid. In scientific circles great interest attached to Dr. Calvert's protoplasmic investigations, some of the results of which were communicated in a paper read at the meeting of the British Association in Edinburgh some years ago, and afterwards published in the Transactions of the Royal Society. Dr. Calvert was a Fellow of the Royal Society of England, a Fellow of the Chemical Society, and an honorary Fellow of the Chemical Society of Paris. He was also a member of the Royal Academy of Turin, and of the Imperial Academy of St. Petersburg.

THE death is announced of Prof. J. A. F. Breithaupt, of Freiberg, the well-known Mineralogist, on October 22, at the age of 82 years.

Ocean Highways announces the death from scurvy on the Novaya Zemlya Coast, of the distinguished Norwegian Arctic Explorer, Captain Sivert Tobieson.

AT the meeting of the Royal Geographical Society last Monday, Sir Bartle Frere, the President, said that, though there