

presence of foreign matter, apparently dust, in the interior of his magnetic instruments. He now writes:—"In NATURE, vol. vi. p. 286, Fig. 2, is a thing very like the organic functions I speak of as being seen on the knife edge and plane of the vertical force magnetograph. I have described it as looking like the 'inter-lacing tea leaf stalks,' doubtless it was beginnings of life."

Can any of your readers state if it is probable that such objects are to be found in the place he names.

Kew Observatory, Oct. 23

G. MATHUS WHIPPLE

### THE APPEAL FOR SKELETONS OF WILD ANIMALS

I AM glad to see that Mr. Moseley has started the question of the acquisition of skeletons of wild animals, a subject which has hitherto been too much neglected by those who have charge of museums. Mr. Moseley might have put his case more strongly than he has done; for not only are the two museums he mentions destitute of skeletons of the wild specimens of the larger *Felidae*, but, so far as I know, no European museum possesses more than skulls. Possibly there may be an entire skeleton in the very rich museum of Leyden, but there are none in the British Museum, nor at Paris, nor Vienna, so far as I have been able to examine those collections. We are better off at Cambridge, for we not only have a considerable series of skulls of tigers, leopards, and the so-called "maneless" lion of Guzerat, but a fine skeleton of a Puma (*Felis concolor*) sent home from Florida in excellent condition by one of that much-abused class, "sportsmen."

There is, however, a subject even more important than the acquisition of foreign animals, namely, the collection of a good series of skeletons of different ages and sexes of all the European mammals. This is no easy matter, even in the case of the commoner species. We have only lately succeeded in acquiring an adult skeleton of the Red Deer (*Cervus elaphus*); but the one we have obtained (through the kindness of Mr. Balfour, of Trinity College) is an adult Royal stag, so fine as to be worth waiting any length of time for. Again, how many museums possess a skeleton of the brown bear of Europe, or the lynx, or the glutton, or the wolf, or even really good skeletons of such comparatively common animals as the badger, the otter, and the numerous small *Viverridae*? And yet the bones of these occur more frequently in turbaries than do those of the extinct *Felidae* in caves, while they are certain to become extinct from the pressure of civilisation and the consequent restriction of their range, far sooner even than those large animals which are directly persecuted, as tigers are in India.

I find it easier almost to get skeletons sent from abroad than to have them collected in England. Any gentleman who unites with love of sport a knowledge of natural history—no uncommon combination—will often send home considerable collections, and take great trouble to procure the different animals that he has been asked to look for. Such a collection we have just received from Lord Walsingham (of Trinity College), formed by him in North-west America. It includes complete skeletons of *Ovis montana*, *Antilocapra americana* (Pronghorn), white-tailed stag, mule deer, black bear, beaver, martin, besides a series of separate skulls. Last year we got an *Otaria* from San Francisco, one of the herd which the intelligent citizens of that capital are wise enough to preserve, and a musk-ox from the German North-Polar Expedition. In short, there are few animals that may not be acquired by energy and perseverance; and travellers in distant countries are fond of showing that they have not forgotten their old university; but it is infinitely more difficult to induce gentlemen, or their keepers, in England or Scotland, to collect the wild animals that still linger in their preserves; and this is the direction in which I venture to think an effort should be made.

The "directions for preparing skeletons" given by Mr. Moseley are excellent. Allow me to make one or two additions to them. It is most important to note the sex of each animal, with the locality in which it was taken and the date of its capture. I do not recommend the soaking of the carcase in water after the muscles have been removed. It loosens the ligaments, and makes the after-process of drying more difficult—a process which is difficult enough in Europe, especially in mountainous districts. Moreover, it is difficult to find a suitable place to do it in abroad. I find the colour of the bones not seriously affected by the non-extraction of the blood. The skeleton may be packed up before it is quite dry if sawdust be substituted for hay or straw. Pine sawdust is especially good for this purpose. It is very fine, dry, and slightly antiseptic.

Museum, Cambridge, Oct. 24

J. W. CLARK

### THE ZOOLOGICAL STATION AT NAPLES

SINCE the last notice given in NATURE,\* the building is almost finished, and all endeavours are now concentrated upon the arrangements of the interior. Two more months, and the fifty-three tanks of the public aquarium will be ready to be filled with the clear and limpid water of the Mediterranean.

The upper story receives still more attention. My plan of letting the tables having met with great applause from all sides, has worked some changes in the general arrangements of the rooms. The room previously intended for the library has been added to the great laboratory, which now measures 40 ft. in length, 25 ft. in breadth, and 24 ft. in height. It has three great arched windows 20 ft. high and 10 ft. broad, to the north, and three smaller ones looking into the small light-court in the centre of the building. The former three windows will give light to six microscopic tables, whilst the three smaller windows will yield enough light to three tables fitted up for common anatomical work. In the centre of the laboratory a wooden stand will be placed, 27 ft. in length and 8 ft. in breadth, and having three stories. This stand will bear tanks of different sizes—the lowest story the heaviest, the upper the smallest. The latter will be moveable, so as to allow close inspection on the working table. Each of them will receive a small current of sea-water, and will have its own outlet, so as to isolate completely its contents from the neighbouring tanks. There will be plenty of room for some sixty or eighty tanks. The water running out of them is collected, and runs down into the tanks of the public aquarium. Four doors unite the laboratory to the three adjacent smaller rooms, which are provided each with a working table and with tanks, whilst the fourth door leads to a corridor and to the staircase. A gallery all round the walls of the laboratory, at the height of fourteen feet, will furnish room for the library. Two small staircases unite it to the floor of the laboratory, and four narrow doors to four adjacent small rooms, of which two may be used as reading-rooms for making notes, &c. It will be absolutely forbidden to take any book out of the building.

On the same floor as this great morphological laboratory, the physiological one is to be found; indeed the door which opens to the corridor leads also immediately to the room destined for this purpose. Its length is 20 ft. by 14 ft.; it has several glass doors to the west, opening upon an ante-room as wide as the room itself, and which, in case of need, can easily be transformed into a laboratory, thus enlarging the physiological laboratory to double its present size; it has a separate tube, with a constant supply of sea-water, and a table for microscopic work. Prof. du Bois-Reymond has promised to assist in arranging instruments and apparatus for experimental use.

\* See NATURE, Vol. v. p. 437.

Besides these laboratories, there are rooms with windows and glass doors, all capable of being transformed, when necessary, into laboratories, for every room has its tube with sea-water. But as it is most likely that by-and-by extensive collections will be formed, to assist in working out a most accurate and detailed fauna of the Bay, or even of the Tuscan Sea, these rooms, especially a large one on the south side, will at first be left empty.

Downstairs there is another small apartment on the north side, destined for a botanical laboratory. It has one large and two smaller windows, thus allowing four microscopical tables to be furnished, three of which will be let, whilst the fourth belongs to the botanist of the station, who is to be engaged next winter. In the basement two series of store-tanks will be placed, into which all the animals will be put immediately after being caught by the fishing and dredging expeditions, which will be sent out every day, weather permitting.

The library of the station has received many valuable presents. Thus Prof. Allman, Mr. Darwin, Prof. Flower, Mr. Gosse, Prof. Huxley, Mr. Gwyn Jeffreys, Sir John Lubbock, and Prof. Owen, have promised or sent their biological works; and German publishers, such as Georg Reimer of Berlin, and Braumüller of Vienna, have joined Engelmann, Vieweg, and Fischer, in offering all their biological publications. A catalogue is being prepared, containing a complete list of the actual state of the station library.

By the kindness of Mr. Gwyn Jeffreys, dredges have been procured of the best pattern, such as that experienced zoologist recommended; boats have been built for special dredging purposes, and everything also is being prepared to render the station as efficient as possible.

We hope in our next article to give some information as to the relations, into which the new institute has entered with governments and learned bodies. Here we may still be allowed to point out, that since the foundation of the Naples station has been taken earnestly into hand, similar endeavours have been made both in Austria and France. In both countries the Government has been asked to establish Zoological Laboratories on the coast. We have still to wait the results of such demands.

Naples, Oct. 24

ANTON DOHRN

#### VESTIGES OF GLACIAL ACTION IN NORTH-EASTERN ANATOLIA

IN a paper dated some months back\* I gave an abridged notice of some traces of ice-action, referable to the so-called epoch, in the central plateau of Asia-Minor. A journey undertaken this summer through the north-eastern districts of the peninsula has enabled me to observe several other phenomena of the same class, and to determine in some measure the extent and degree in which that prolonged depression of temperature affected this region.

My route traversed an extensive but rarely visited tract of country, that, namely, of the great Chorok, or Harpagus river-valley from Beyboort to Artween, and the mountain lands that extend beyond that valley east and north up to the frontier of Russian Georgia, returning by the Black Sea coast. The space thus explored extends from long. 40° to 44° E., and from lat. 40° to 42° N.

The valley of the Chorok river, for a distance of about 120 miles—that is, from the neighbourhood of Beyboort to that of the town of Artween—runs almost parallel with the sea-coast in an E.N.E. direction, and is separated from the basin of the Euxine by a lofty chain of mountains, the higher peaks of which reach an altitude of 11,000 feet above the sea-level, and even more. The whole long and narrow strip of land bears the name of Lazistan, or country of the Lazes, a Mingrelian tribe, mentioned by Strabo as tenanted the same region in his time.

\* See NATURE, vol. v. p. 444

Near Artween, long. 42°, the valley turns sharp to the north, and finds its way through a narrow and precipitous cleft to the sea.

The southern side is determined by the highlands which form the watershed between the tributaries of the Black Sea and those of the Persian Gulf; but farther east the same range, deflecting somewhat to the north, unites with the prolongation of the Lazistan mountains, and acts as watershed not only to the already-mentioned streams, but also to those of the Caspian, which it separates from the two other fluvial systems. Farther on the Russo-Georgian frontier follows its eastern slope.

Returning to the Chorok valley—one might almost call it trench—I may as well notice that its height above sea-level at Beyboort is about 5,000 feet, and at Artween only 1,000 feet, whence the extreme rapidity of the river, suitably named the Harpagus, may be inferred. The geological character of the mountain chains on either side is extremely varied. Cretaceous and Jurassic strata have in both been extensively superimposed on the plutonic rocks that frequently pierce through and form the higher ranges; volcanic formations, less ordinary in the southern chain, are of frequent recurrence in the northern. Indeed the Lazistan mountains, where they dip into the sea, are almost wholly volcanic in structure. Large tracts of a metamorphic character also occur, but more on the northern than on the southern side.

Roads, in a European sense of the word, throughout all these districts, there are none; even a tolerable horse-track is only an occasional luxury. Hence my entire tour was performed partly on horseback at walking pace, partly on foot; so that I had full opportunity for the most leisurely observation. My route first followed the southern side of the Chorok valley for about seventy miles, then the northern for about fifty more, after which I traversed the eastern highlands to the Russian frontier, a distance of about 160 miles, then turned north till I reached the Black Sea coast, along which I returned.

And having now given these summary indications, which the nature of the country, scarcely ever visited by Europeans, and in general very little known, seemed to make necessary, I will now proceed to the account of the principal phenomena referable to the glacial period.

While travelling at an altitude varying from 3,000 to 7,600 feet according to the exigencies of the route along the southern side of the valley—that is, on the northern slope of the Euphrates watershed—I crossed three large moraines, two of them descending from the slopes of Charmeli Dagh, a lofty granite ridge, streaked with snow all through the year. Their lower extremity was at about 5,000 feet above sea-level, their upper origin attaining nearly 8,000 feet. The mountain sides here are Jurassic or limestone; but the broad streams of angular blocks that follow their depressions were almost exclusively granite of the same kind as that which forms the mountain wall above. Where, however, the general altitude of the chain does not exceed 7,000 feet, as is occasionally the case, no moraines are to be observed, though large angular boulders are not uncommon on the broad ledges. The upper mountain lines are invariably rounded, and, as it were, smoothed off; the sides marked with scooped depressions much too wide for their depth to be attributable to torrent action; low down in the valley the slopes terminate in rifted precipices.

That the epoch to which these moraines belong was posterior to that of the volcanic action which, though long since extinct at the surface, has left so many traces along the north-eastern coast of Asia-Minor, was rendered in one instance sufficiently evident by the constituents of a broad stone-ridge which I crossed near the highest point of the mountain chain, a little to the east of Erzeroom.

Here, at an elevation reaching to upwards of 7,000 feet, the ordinary Jurassic strata were interrupted by a volcanic outbreak of several miles in extent, like a huge patch of