spread of the "thermophytes" in Central Europe since the "fourth ice-period"; and a third with the division of Central Europe into floral districts; followed by some seventy pages of explanatory remarks on the points raised in the preceding chapters. Unfortunately for those who would wish to consult this book, it has neither index nor headings of any kind. There is no attempt whatever to classify the facts and data; no map, no summary, no digest, no general conclusions; indeed, no help at all for the reader desirous of knowing what the writer has arrived at, or is leading up to. He begins with the assumption, that only very few of the plants which now inhabit Europe were already here in Miocene times, and that a large majority of the present vegetable inhabitants consist of immigrants and such as have originated within the territory since the beginning of the Pliocene period. The homes of the migrated species he would seek in Arctic America, but chiefly in Asia; and a very small number he considers have migrated from North Africa. In illustration of migrations the author gives full details of the present distribution of a small selection of plants; but only in words, so that it is a study to trace the areas. Having thus called attention to this work, we must leave it to the reader with leisure to follow the writer through his four ice-periods, and the present distribution of the leading elements of the flora of Central Europe; and we may add, that he will find much interesting matter.

Elementary Metal Work. By G. C. Leland. (Whittaker and Co., 1894.)

THIS book is devoid of scientific or general interest, merely treating of certain kinds of decorative metal work which can be executed by amateurs and children, and which, as a general rule, we would far rather be without. There have been instances, however, in which metal working at home, directed by energetic people of taste and leisure, has been found to greatly benefit working men and their families who are forced to be comparatively idle in winter. In a certain charming spot in the Lake District, where such objects are readily disposed of to tourists, the results have been most satisfactory, and we wish some such home industries could be introduced into parts of Ireland and Scotland frequented by visitors in summer, where the enforced winter idleness produces an amount of poverty painful to think of.

J. S. G.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Earth Currents.

THE Astronomer Royal was kind enough to show me the permanent photographic records of earth currents during the great magnetic storm on February 20-21, and they indicated so unmistakably such rapid and violent alternations, that I supplied our principal relay stations with telephones and with instructions to insert them in circuit whenever they observed indications of disturbances. This happened on March 30-31, during the display of the Aurora Borealis. Mr. Donnithorne, in Llanfair P.G., Anglesea, reports:—"At 2.0 a.m. (Saturday) the telephone receiver was again tried, and then 'twangs' were heard as if a stretched wire had been struck, and a kind of whistling sound. The strength of the earth current was 17.7 milliamperes." Mr. Miles, in Lowestoft, reports:—"Noise on 408 (Liverpool-Hamburg) wire seemed like that heard when a fly-wheel is rapidly revolving," and "sounds in telephone appear like heavy carts rumbling in the distance." Mr. Scaife, in Haverfordwest, reports:—"March 31, 2.5 a.m.

Earth currents on all wires; wires completely stopped. . . . Peculiar and weird sounds distinctly perceived, some highly-pitched musical notes, others resembling murmur of waves on a distant beach. . . . The musical sounds would very much resemble those emitted by a number of sirens driven at first slowly, then increased until a 'screech' is produced, then again dying away. Duration of each averaged about twenty seconds." These experienced observers, situated at three distant points, and perfectly acquainted with the ordinary inductive disturbances on telephone circuits, simultaneously observed and independently recorded their own impressions of peculiar sounds exerted in telephones by very rapid alternations or pulsations of currents which accompanied or were consequent on sun-spots, earth currents, and the Aurora Borealis.

G. P. O., April 9.

W. H. PREECE.

The Aurora of March 30.

I VENTURE to supplement the reference in NATURE to the Aurora of March 30, by a brief account of an observation made by me at Bristol.

At about 10.30 p.m. I noticed against a dark blue sky a single narrow rose-coloured ray stretching from between α and β Ursa Majoris to the neighbourhood of δ Aurigæ, and slightly beyond it. It was speedily joined by a second and then by a third ray, apparently diverging from a common centre about 5 degrees beyond α and β Ursa Majoris. The three rays gradually became less divergent, and merged into one broad beam, which ultimately faded away: the whole phenomena lasting about 5 or 6 minutes only. At the same time there was a greenish-white luminosity on the N.N.W. horizon, suggestive of a belated and misplaced sunset. I understand that this had endured for a long time, perhaps an hour or more.

J. RYAN.

University College, Bristol, April 9.

Crystalline Schists of Devonian Age.

IN a recent number of NATURE (vol. xlix, p. 435) Prof. Bonney writes:—"Speaking for ourselves we think he (Prof. van Hise) is disposed to . . . admit on too slight evidence that in 'Silurian, Devonian, and even later times, completely crystalline schists have been produced over large areas'; for in the past this assertion has been so often made, and so often proved erroneous, that on the principle, 'once bit, twice shy,' we are disposed to be a little sceptical."

Mere assertions in geology, as in general science, are scarcely worth the trouble of contradicting; but in one case, at least, the evidence of the existence of completely crystalline "Devonian" schists does not rest on mere assertion.

I published certain microscopic evidence in favour of the Devonian age of the schists of the Start and Bolt district in the *Geological Magazine* in 1892, and as Prof. Bonney would not condescend to weigh the said evidence, but contented himself by attempting to defend his own position by "abusing plaintiff's attorney," I proceeded to dissect his own argument for the Archean age of the rocks in question in a separate publication.

Until the facts and arguments advanced in support of the "Devonian" age of these crystalline rocks, and the arguments against Prof. Bonney's rival hypothesis, (the latter based on a brief week's investigation of a district which has puzzled geologists for over half a century) are all fairly met, I must deprecate any attempt being made to lead the readers of your journal to believe that the doctrine of the "Devonian" age of the Devonshire schists has been "proved erroneous."

Torquay, March 23.

ARTHUR R. HUNT.

P.S.—When the above was written I had not seen the remarks of the Director General of the Geological Survey on the metamorphic area of South Devon, published in your issue of March 22 (NATURE, vol. xlix, p. 497).

William Pengelly.

PROF. BOYD DAWKINS, in his otherwise excellent obituary of Pengelly, refers to the Bovey Tracey beds as a Miocene Lake deposit. They are, however, not lacustrine but fluvial, consisting of current-bedded coarse grits alternating with lignitic muds, such as are deposited in stretches of still water when the main current cuts itself a new channel. Lithologically these beds are identical with those of Corfe and Bournemouth, and there is no reason to doubt their being the

deposits of one and the same river. Neither are they Miocene, if the evidence of fossils is to be trusted; and we have no other guides in this case but the lithology and palæontology, since the identifiable and most characteristic fossils are also found in the Middle Bagshots of Bournemouth, in a precisely similar matrix, and in the same state of preservation. In determining the age of the deposits, great stress was laid on the supposed identity of the *Sequoia Coultzie* of Bovey with that of the Hamstead beds; but by visiting Bovey not long since, and obtaining perfect specimens of the cones, I satisfied myself that the Bovey plant is a true *Sequoia*, with scales growing at right angles from the axis, and with compressed winged seeds; while even more perfect specimens from Hamstead, obtained soon after, showed the scales inserted at the base, and the seeds wingless, falling thus more properly into *Ahrotaxis*. The foliage growth is also entirely different, though the leaves are similar. The point is of some importance, yet the mistake having been made by such "heroes of geology" as Heer and Pengelly, is extremely hard to eradicate.

J. STARRIE GARDNER.

A Rejected Address.

CONSCIOUS that the protestant is a weak-kneed *urochs*, I ask permission to protest by implication against a common trivial mistake. How long will people go on writing about "political meteorology" and the like, meaning, by this, haphazard prediction? The meteorologist is as near a cousin to the local "weather-prophet" as Helmholtz to the artisan who is making a spectacle-case; or, to use an illustration lent me by a lady, as the astronomer is to the astrologer.

April 9.

NUBES.

THE LIMBS OF LEPIDOSIREN PARADOXA.

DR. GÜNTHER, in his valuable work, "The Study of Fishes," says of Natterer's *Lepidosiren* from the Amazons, "It is one of the greatest desiderata of

FIG. 1.

natural history collections." In fact, only seven years ago the opinion was current that Natterer had been deceived by specimens of *Protopterus* imported from Africa, or that in some way African specimens had been mixed with his American collections.

I was therefore greatly pleased to obtain recently for the Oxford University Museum, by purchase from a London dealer, specimens of the *Lepidosiren* of the Amazon well preserved in spirit. I immediately noticed a peculiarity about the pelvic fins, which it is the object of the present note to make known. These fins, whilst more robust than the pectorals, were remarkable for exhibiting upon their dorso-mediad surface a clothing of well-developed "villi," the appearance of which is best gathered from the accompanying sketches (Figs. 2 and 3).

As many as four "villi" were in some cases united at the base, or mounted on a short trunk.

No such "villi" are known in the African *Protopterus*, nor in *Ceratodus*.

The specimen figured by Natterer showed no trace of these "villi." This was a female, whilst the specimens recently imported which exhibit the "villi" are males.

I am at present engaged in an examination of the minute structure of these "villi" of the pelvic limbs of

Lepidosiren. Whether tactile or respiratory, they form a most remarkable feature, and it seems worth while to place a brief notice of them at once in the hands of naturalists.

Natterer's figure of *Lepidosiren* (which has often been copied) is not good. It does not give a fair idea of the proportions of the animal. I hope soon to publish a careful drawing of life-size. *Lepidosiren* is distinctly

FIG. 2.

longer in proportion to breadth than is *Protopterus*, and there is a greater distance between the pectoral and pelvic fins in *Lepidosiren* (in proportion to total length) than in *Protopterus*. The median fin is not so deep in *Lepidosiren* as in *Protopterus*.

The woodcuts are as follows:—

Fig. 1 represents the left pectoral fin and opercular opening.

Fig. 2 shows the left pelvic fin, drawn to the same scale, in its natural position of rest; the long axis nearly parallel with the long axis of the body.

Fig. 3 shows the same pelvic fin turned forward (a position which the animal can give it in life), exposing the dorso-mediad face of the fin with its numerous "villi."

FIG. 3.

The lifting of the fin has also exposed the anus, which lies on the left side of the median line of the body.

E. RAY LANKESTER.

March 20.

BEEES AND DEAD CARCASSES.¹

DURING the last two hundred years our knowledge of natural and physical science has advanced by leaps and bounds, until, in most departments, it has risen to a level far exceeding anything which has been recorded during historic times. Hence, in dealing with improbable or impossible statements which have come down to us from classical or mediæval times, we are perhaps too apt to forget the old proverb that "there is no smoke without fire," and to dismiss them at once as vulgar superstitions, instead of seeking for the substratum of truth which will often be found to underlie them. Even so plain and simple a statement as that ants store up food was long discredited; for, as the ants of Northern Europe do not possess this habit, it was supposed to

¹ "On the so-called *Bugonia* of the Ancients, and its Relation to *Eristalis tenax*, a Two-winged Insect." By Baron C. R. Osten-Sacken. Reprinted from the *Bulletino della Società Entomologica Italiana*, Anno xxv. 1893.