galvanometer should show a stronger current of electricity passing, on the principle that most, if not all, non-metallic substances that are conductors of electricity become better conductors on the application of heat. I judge that the galvanometer test would be a very perfect one. GEORGE B. RICHMOND
Lansing, Michigan, U.S.A., March 5

The Oldest Fossil Insects

I SHALL be glad if you will afford me an opportunity of explaining one or two personal matters referred to in p. 11 of Mr. Scudder's memoir on the Devonian Insects of New Brunswick, which was mentioned in your last number (pp. 483, 4). He very justly takes exception to some bibliographical and orthographical errors committed by me in *Trans. Entom. Soc. Lond.* 1871, pp. 38-40, in a notice of fossil insects named and described by him, and naturally regards them as evidence of insufficient study of the literature relating to them. It is difficult to say precisely what happened upwards of ten years ago, but I am satisfied that the mistakes must have arisen in one or the other of these two ways. Either I attributed the authorship of the names to the person who first published figures of the fossils, on the ground that names bestowed upon insect-fossils by the publication of descriptions, without accompanying figures, rank as mere "Catalogue" or MS. names devoid of priority; or else they are due to circumstances under which the citations were collated. Closely pressed for time, and without much experience in the art of citation, it is as likely as not that, after forming an opinion upon the plates and consulting the letterpress to see what the author had to say about them, I referred from force of habit to the title-page of the volume for the date of publication and the author's name, instead of turning to the heading of the article for this last.

In the same page of his memoir Mr. Scudder alludes to the following passages in p. 39 of my work, over which we had some fun when he was last in England, though the strictures were not aimed at him more than at the others. "Palæontologists have adopted a ridiculous course with regard to some insect fossils. Whenever an obscure fragment of a well-reticulate insect's wing is found in a rock, a genus is straightway set up, and the fossil named as a new species. The species is then referred to the *Ephemeridæ*, and is immediately pronounced to be a synthetic type of insects at present distantly related to one another in organisation. This enunciation of synthetic types is often nothing less than a resort to random conjecture respecting the affinities of animals which the writer is at a loss to classify. An insect allied to the *Ephemeridæ* which chirped like a locust (such as *Xenoneura* is imagined to have been), is a tolerable sample of these synthetic types. When a fossil comprises only a fragment, or even a complete wing of an Ephemerid, it is hardly possible to determine the genus, and impossible to assert the species. The utmost that can be learned from such a specimen is the approximate relations of the insect. Neuration by itself is not sufficient to define the species or even the genera of recent *Ephemeridæ*." What I meant to be deduced from this was that, where in the nature of things actual precision is unattainable, palæontologists should be content to learn and state the "approximate relations" of fossil insects, and not presume upon the ignorance of scientific men in the matter of genera and species. And I further thought that the *Ephemeridæ* had served quite long enough as an asylum for fossil cripples; I wished to intimate gently that refuse of other groups of insects should be henceforth "shot" elsewhere.

Mr. Scudder does not know by whom the Devonian insects "have all been regarded as allies of the *Ephemeridæ*." My authority for stating such to have been the case is Sir John Lubbock's Presidential Address in *Trans. Ent. Soc. London*, v.; *Proc.* cxviii. (1868), where "*Haplophlebium Barnesii* . . . is referred to the *Ephemerina*," and likewise "*Platephemera antiqua*, *Homothetus fossilis*, *Lithentomon Hartii*, and *Xenoneura antiquiorum*" are said to be "all Neuropterous and allied to the *Ephemeridæ*." As members of this family they are quoted by Marshall. *Dyscritus vetustus* was not cited by Sir John; but since Mr. Scudder now states it (p. 22) to be "most closely allied" to *Homothetus*, there was no harm done in classing it with the rest.

The reason why I thought, prior to the publication of Dr. Hagen's letter in NATURE, that *Platephemera* might have been an *Ephemeron*, was that in some respects Mr. Scudder's figure presents an appreciable likeness to the neuration of the fore-wing

in species of *Palingenia*, of which I possess unpublished drawings; but these certainly are not quite so odonatonous in detail as *Platephemera*. Without inspecting actual specimens, it is hazardous to pronounce an opinion about fossils.

A. E. EATON

Chepstow Road, Croydon, S.W., March 28

Oceanic Phenomenon

FROM the description given by Dr. Coppinger of the "confervoid alga" observed on board H.M.S. *Alert* some 200 miles to the southward of Tongatabu (NATURE, vol. xxiii. p. 482), the conferva in question would appear to be of a species similar to that from which the Red Sea is said to obtain its name. Whilst proceeding up the Red Sea in H.M.S. *Hornet* during the month of June of last year, I had many opportunities of observing the dirty-reddish scum on its surface—a phenomenon which must be familiar to all navigators of this sea. Each of the little bundles composing it measured about $\frac{1}{16}$ th of an inch in length and $\frac{1}{16}$ th in breadth, and contained from twenty to fifty filaments, each filament being composed of a linear series of short cells, and measuring $\frac{1}{16}$ th of an inch in breadth. I did not observe the discoid bodies referred to by Dr. Coppinger, but their absence may be explained by assigning to this conferva a particular season for the production of these bodies. Scattered among the bundles were tiny spherical bodies possessing a bristly appearance, which proved to be formed of a confused network of the filaments that composed the bundles.

This conferva would appear to have a very wide distribution. It was observed by Mr. Darwin near the Abrothos Islets which lie off the east coast of South America; and it is with regard to this phenomenon that the author of the "*Journal of the Beagle*" thus writes:—"Mr. Berkeley informs me that they are the same species (*Trichodesmium erythraeum*) with that found over large spaces in the Red Sea, and whence its name of Red Sea is derived. In almost every long voyage some account is given of these confervæ. They appear especially common in the sea near Australia; and off Cape Leeuwin I found an allied but smaller and apparently different species. Capt. Cook in his third voyage remarks that the sailors gave to this appearance the name of sea sawdust." H. B. GUPPY

17, Woodlane, Falmouth, March 28

The Banks of the Yang-tse at Hankow

AT the end of January, 1878, when the waters of the Yang-tse occupied their lowest level, I had the opportunity of examining the left bank of the river immediately below the foreign settlement. The bank, which varied from thirty to thirty-five feet in height, did not present a single perpendicular face, but was cut up into two or more terraces formed by the lingering of the waters at those levels for some extent of time. A calcareous loam, homogeneous in appearance and dark in colour, composed the entire bank with the exception of the upper portion, where a layer of sand a few inches in thickness separated two layers of laminated loam, each of them of similar thickness. After a little trouble I was enabled to observe that the apparently homogeneous loam was made up of fine horizontal layers varying from one-thirtieth to one-tenth of an inch in thickness; but the lamination was often concealed; and it was only where the loam had been freshly broken away that the layers were sufficiently distinct to be counted. Shells were embedded in the loam, but mostly in the lower half of the bank; those of the genus "*Paludina*" were the most abundant, whilst bivalves of the genus "*Corbicula*" occurred, but not in any numbers. The upper three feet of the river-bank were riddled with the burrows of annelids, and these burrows were often filled with little rounded masses of loam, evidently the excrementitious droppings of the worms.

If, as in the case of the alluvial valley of the Nile, it be considered that each of the fine layers which compose the bank of the Yang-tse was deposited during the periodic annual inundation of the river, then every layer will represent a year's deposit; and taking the average thickness of each layer to be one-twentieth of an inch, it would require twenty years to form an inch and a century to form five inches; whilst the whole thickness as exposed in the river-bank would require for its formation a period of between 7000 and 8000 years.¹

¹ The borings and excavations round the pedestal of the statue of Rameses at Memphis enabled Mr. Horner to estimate the rate of deposition of the alluvium of the Nile at $\frac{1}{32}$ inches in a century. (Vide Lyell's "*Principles of Geology*.")

It may be pertinent to the subject of this paper to remark on the general appearance of the region around Hankow. A vast alluvial plain extends to the horizon in all directions; whilst dotted over its surface are several shallow lakes, which are lost in the general flood of waters when the Yang-tse overflows its banks in the summer months. Rising abruptly out of this alluvial formation are a few isolated groups of low hills, which in the time of flood stand out like islands from the surrounding waste of waters.

It would be interesting to ascertain whether the banks of the Yang-tse possess this lamination whenever the river winds its way through an alluvial plain. I noticed the same appearance in the low banks of the estuary near the village of Wusung; the horizontal layers varying in this instance from one-tenth to one-fourteenth of an inch in thickness. Shells of both fresh-water and salt-water genera—"Paludina" and "Mactra"—were embedded in the bank.

H. B. GUPPY

An Experiment on Inherited Memory

WHEN I was a boy I had an electrical machine and Leyden jar; there was also a dog in the family. As a matter of course I "electrified" the dog, and ever afterwards during the remainder of his natural life he ran away in extreme terror when a bottle was presented to him.

The recollection of this has recently suggested an experiment that may be made by some of the readers of NATURE. By means of a small Leyden jar moderately charged startle both the father and the mother of an intended forthcoming generation of puppies. When these are full grown and away from their parents observe whether they are at all disturbed by the sight of a bottle or a Leyden jar, care being taken that the bottle is never shown to the parents in the presence of the offspring.

A single experiment will not be sufficient. It should be tried by several; for which reason I suggest it here. There is no more cruelty involved than in an ordinary practical joke. It is not the pain of the shock, but its startling mystery that frightens the animal, especially if the shock is given by placing the jar on a piece of tinfoil or sheet metal, and allowing the dog spontaneously to investigate by smelling the knob of the jar while his fore-feet are in communication with the outer coating. Under ordinary circumstances the dog obtains through his nose much information concerning the properties of things before he actually touches them, but in this case his whole life experience is contradicted by the mysterious, inodorous, diabolical vitality of the vitreous fiend. A bottle thenceforth makes upon the intellect of the dog a similar impression to that which a sheeted broomstick in a churchyard makes upon the similar intellect of a superstitious rustic.

W. MATTIEU WILLIAMS

Stonebridge Park, Willesden

Meteors

THREE very bright meteors were observed here during the month of December, 1880, and are, I think, worthy of record.

1. December 2, 1h. 14m. 50s. a.m. A meteor brighter than Jupiter descended towards the west point of the horizon, passing about 1° N. of Saturn, and somewhat farther from Jupiter, and in a line therefore nearly parallel to that joining those two planets. The train was visible about three seconds.

2. December 8, 10h. 55m. 30s. p.m. A meteor as bright as Jupiter descended towards the north point of the horizon, about 1° below η Ursæ Majoris, its path being inclined at an angle of about 35° to the horizon. The train was brilliant, but vanished speedily.

3. December 24, 10h. 4m. p.m. A very bright meteor, seen through (or below) the clouds in the south-south-east, shot down towards the south-south-west point of the horizon, at an angle of about 30°. No stars were visible in that part of the heavens at the time.

J. PARNELL

Upper Clapton, March 17

Classification of the Indo-Chinese and Oceanic Races

IN your issue of December 20 (p. 199), just to hand (February 12), I notice a contribution by Mr. A. H. Keane on the classification of the Indo-Chinese and Oceanic races.

As the *Orang Semang* of the Malay Peninsula is only just referred to, I conclude that the author has not seen Maclay's

papers on the wild tribes of the Malayan Peninsula in the second number of the *Journal* of the Straits Branch of the Royal Asiatic Society and a memoir by the same writer in the *Journal of Eastern Asia*, of which unfortunately only one number appeared. On the Jakuns, Maclay, who has probably seen more of their inner life and habits than any other ethnologist, writes as follows of the *Semang* and *Lakai* tribes:—"Logan" (*Journal of the Indian Archipelago*, vol. vii. p. 31, 32), "though differing from some others, says that the *Orang Semang* are certainly *Negritos*, but he calls them a mixed race. According to my experience I must declare this also to be incorrect.

"From my own experience and observations I have come to the conclusion that the *Orang Lakai* and the *Orang Semang* are tribes of the same stock, that further, in their physical *habitus* and in respect of language they are closely connected with each other, and represent a pure unmixed branch of the Melanesian race; anthropologically therefore they absolutely differ from the Malays. The Melanesian tribes of the Malay Peninsula, chiefly because of the form of their skull, which has a tendency to be brachycephalic, approach the *Negritos* of the Philippines, and, like the latter, they do not differ very widely from the Papuan tribes of New Guinea."

In the fifth number of the *Journal* of the Straits Branch of the R.A.S., Mr. Swettenham, the Assistant Colonial Secretary for the Native States S.S., thus describes the *Semangs* of Ijoh:—

"These people are short in stature, dark in colour, and their hair is close and woolly like that of negroes, with this difference, that all the men wear four or five short tufts or corkscrews of hair growing on the back of their heads, called *jamul*."

During my botanical excursion through Perak in 1877 I had two *Semangs* as guides, answering to Mr. Swettenham's description.

The Straits Branch of the R.A.S. is as yet in its infancy, having been established only in 1877, and its *Journal* has probably not yet secured a very wide circulation, although the five numbers that have been published contain probably more authentic information about the Malayan Peninsula than can be found elsewhere.

The characters Mr. Keane has employed to indicate the word "papiwah" are certainly not Malayan; at any rate it would be a matter of impossibility to secure the services of a Malay in Singapore who would be capable of deciphering them. The word, which is a corruption of the Malayan or Javanese adjective

puwah-puwah, is usually spelt thus—قفوة

Writing about New Guinea, Crawford ("A Descriptive Dictionary of the Indian Islands," p. 300) thus expresses himself about the word Papua:—"Some recent geographers have thought proper to give the great island the name of Papua, but an innovation which is correct neither in sound, sense nor orthography seems to possess no advantage over one which it has borne now for nearly three centuries and a half."

It may not be out of place here to remark that Messrs. Trübner and Co. are the London agents of the Straits R.A.S. Singapore S.S., February 12 H. J. MURTON

Fascination

IN the interior of the province Valdivia, South Chili, a species of wood-snipe (*Paipayan inc.*) is often caught by the natives in the following manner:—When the bird flies into one of the low bushes, which in spots of about three to six metres diameter are found frequently in the wood-meadows there, two men on horse-back go round it in the same direction, swinging their lazos over the bush. After ten or more rounds one man slips down from his horse, whilst the other continues, leading his companion's horse behind. Carefully then the first man creeps on to the point, where the paipayan is sitting nearly motionless or stupefied with the rider's circular movements, and kills it by a quick blow of a stick.

When I first was told so I would not believe it; but in 1853 or 1854 I took part myself in this kind of capture in the hacienda San Juan, in Valdivia, belonging to my chief, Dr. Philippi, now professor in the University and director of the museum in Santiago. I had left the house without gun, accompanied by a native servant, when, in a part of the wood called Quemas, I observed a paipayan falling into a dense but low bush of the