

delicate to detect differences in the force of gravity in consequence of our being lifted farther from the centre of the earth every time by the terrain tide as it passed between our feet, could be established in conjunction with the experiments on earth-tremors.

JOHN MILNE

Imperial College of Engineering, Tokio, Japan

Limulus

CONCERNING the systematic place of *Limulus*, I should like to draw attention to a habit which has, as far as I know, never been alluded to in discussions, viz. the manner of casting its skin, mentioned by me in *Deformation of Insects (Mem. Compar. Zoology)*. *Limulus* splits the skin exactly around the front margin of the head. Among Crustacea the Decapods at least split the skin around the hind margin of the carapace. Insects split the skin in the longitudinal middle line of the occiput and thorax, with the later addition of a transversal split on the head. I have seen cast skins of Scorpio, Pseudoscorpions, Hydrachna, and Arachnids, but they are not now at hand for a sure verification. As far as I remember all of them split the skin in the middle line of the anterior parts. At least I do not remember to have seen any transversal anterior split.

H. A. HAGEN
Cambridge, Mass.

The Utilisation of Ants in Horticulture

DR. C. J. MACGOWAN has sent me from Han Chow, Province of Hainan, China, a little paper on the "Utilisation of Ants as Insect Destroyers in China." It seems that in many parts of the province of Canton the orange trees are injured by certain worms, and to rid themselves from these pests, the inhabitants import ants from the neighbouring hills. The hill-people throughout the summer and winter find the nests of two species of ants, red and yellow, suspended from the branches of various trees. The "orange ant breeders" are provided with pig or goat bladders baited inside with larvæ. The orifices of these they apply to the entrance of the bag-like nests, when the ants enter the bladders, and, as Dr. Macgowan expresses it, "become a marketable commodity at the orangeries." The trees are colonised by placing the ants on their upper branches, and bamboo rods are stretched between the different trees, so as to give the ants easy access to the whole orchard. This remedy has been in constant use at least since 1640, and probably dates from a much earlier period. This is certainly a new way of utilising ants, which as a rule are deservedly considered a nuisance by the horticulturist. I should like to learn from any entomological reader of *NATURE* whether the facts communicated have before been known in Europe, and, if so, whether the species of ant has been determined.

C. V. RILEY

Washington, D.C.

Aurora Australis

APRIL 17.—Evening very dark; air close and sultry; thermometer at 65. About 6.35 p.m. noticed a broad sheath of dull rosy red in the south, stretching upwards towards the zenith; from south-east to south was spread a bright greenish-yellow glare, sufficiently luminous to enable us to read the figures of a lady's small watch. Shortly afterwards, the sky from east-by-south to south-south-west was illumined with a ruddy glow deepening to dark red; at the most easterly point of the auroral light were broad pulsating streamers of great brilliancy; these extended to south-east-by-east. Could not detect the slightest sound from aurora. Weather continued fine. April 20.—This evening there was a wide-spread glare of auroral light, with greater range, but of far less brilliancy than marked the grand display on the 17th. Weather fine and clear.

T. H. POTTS

Ohinitaki, N.Z., April 21

"Cuprous Chloride Cell"

As the account given of my cuprous chloride cell in your report (*NATURE*, vol. xxvi. p. 96) of the Proceedings of the Royal Society of Edinburgh is rather misleading, I hope I may be excused if I make a few remarks on the subject. It is there stated that my cells suffered greatly from loss. This is not a correct statement. There are two ways in which the work expended in charging a secondary battery is lost. When a secondary battery is being charged, the E.M.F. between the terminals of the battery is higher than the normal E.M.F. of the

battery with open terminals, work being expended in heating the cells. When the charged cells are used to supply a current, the E.M.F. between the terminals is lower than the normal E.M.F. with open terminals, work being again spent in heating the cells. This source of loss is unavoidable, and is in practice very serious. I need only refer to the recent experiments in Paris with Faure accumulators, which were, I think, reported in *NATURE*. The second source of loss is the local action in the cell. This depends upon the chemistry of the cell. I have found the estimation of loss from this cause a difficult matter, but I think I am justified in saying that the loss from this cause in my cell is very small, when it is properly constructed. In fact, when used as a primary, its advantage is that it does not suffer from diffusion and consequent local action as all double-fluid cells do. I think it deserves a trial as a primary battery on this account. It is necessary to protect the cuprous chloride from air, covering it with water being quite sufficient. If this is done it should be a very durable form of cell.

A. P. LAURIE

King's College, Cambridge

[The statement that the cells suffered greatly from loss is in our report coupled with an additional statement which implies that other secondary cells have the same fault; so that Mr. Laurie is in no worse predicament than other inventors of secondary batteries. Unless Mr. Laurie's cell is in this respect superior to others, the report can hardly be regarded as misleading.—ED.]

Physico-chemical Lecture Experiments

A VERY striking lecture experiment, which I have never seen performed or described, and which illustrates the reaction, by double elective affinity, of *dry solids*, is the trituration together in a mortar of corrosive sublimate and iodide of potassium. The result is a brilliant scarlet coloration of iodide of mercury. If a large crystal of the one is rubbed on a crystal of the other, a scarlet precipitate (if the word may be so applied) is formed at every point of contact. From the brilliancy of the colour the experiment may be readily seen by a large number of spectators.

June 5

LEIGH CLIFFORD

CUPS AND CIRCLES

AN important addition to the literature of "Cups and Circles" and Cup-marked Stones,¹ has just been issued as part of the fifth volume of "Contributions to North American Ethnology," printed by the Department of the Interior in their series of the publications of the U.S. Geographical and Geological Survey of the Rocky Mountain Region. The literature of the subject as regards the Old World is already extensive, and the object of Mr. Rau's work is to collect and systematise the existing information regarding the "cup and ring cuttings" that have been observed on rocks and boulders in Europe and India, and to add to this systematised knowledge an account of those that are now known in America.

The first monograph on these archaic forms of sculpturings on rocks and stones was that of A. E. Holmberg, on the Lapidary Sculpturings of Scandinavia ("Skandinavien's Hällristningar," Stockholm, 1848), but though copiously illustrated, it remained in a great measure a sealed book, from its being written in Swedish; and it was not till the publication of Mr. Tate's memoir on "The Ancient British Sculptured Rocks of Northumberland and the Eastern Border" (Alnwick, 1865); the exhaustive essay on the same subject by the late Prof. Sir James Y. Simpson, entitled "Archaic Sculpturings of Cups, Circles, &c., upon Stones and Rocks in Scotland, England, and other Countries" (Edinburgh, 1867); and the larger work, prepared under the direction of the late Algernon Duke of Northumberland, entitled "Incised Markings on Stone found in the County of Northumberland, Argyle, and other Places, from Drawings made in the Years 1863 and 1864" (London, 1869) that the attention of archaeologists generally was awakened to the

¹ "Observations on Cup-shaped and other Lapidarian Sculptures in the Old World, and in America." By Charles Rau. (Washington, 1881.)