

thigh in other lands than India, I may say that I have observed the same mode of operating upon paper in Japan very frequently. The paper used there is tough and fibrous, and a Japanese is never at a loss for card to tie a parcel with if he has paper beside him. I have seen the spindle-whorl in actual use in upland districts, and it was employed even in Tokio very recently.

HENRY FAULDS

Laurel Bank, Shawlands, Glasgow, April 7

Colony of Cats

IT may interest those of your readers fond of cats to know that a colony of cats live and breed under the wooden platform of the Victoria Station of the District Railway. They may be seen crossing the rails right in front of trains, and considering the enormous traffic, and the consequent noise and vibration, it certainly does seem remarkable that such naturally timid animals as cats should live amidst such unnatural surroundings. It may tend to show the plasticity of the animal creation generally in adapting itself to surrounding conditions. A female cat may have taken refuge there originally, and hence the railway domestication of the animals.

GEORGE RAYLEIGH VICARS

London

Earthworms

SEEING the correspondence on this subject, I am led to give the following fact, which affords a further proof of the necessity of a vegetable deposit being formed previous to the existence of earthworms as stated by Mr. Melvin (vol. xxix. p. 502). A field two years ago was converted into a garden, and on account of bad cultivation, and by reason of each crop being altogether removed for several years in succession, no worms were there, but after the application of a large quantity of stable manure worms have appeared by hundreds, and their castings after rain afford ample proof of their activity. TRANSFORMATION of vegetable mould combined with animal refuse into available food for plants is here made evident.

J. LOVELL

Driffeld, April 7

"The Axioms of Geometry"

PROF. HENRICI, in NATURE, vol. xxix. p. 453, considers Hamilton's proof of Euclid I. 32 invalid; and asserts that from his reasoning it would follow that the sum of the three angles of a spherical triangle equals two right angles. I venture to differ from him for the following reason:—The only thing which Hamilton requires to be granted is that when a moving *straight* line slides along a *fixed* straight line its *direction* is unchanged. This axiom will, I suppose, be granted by every one. Of course it is not true that in every case rotation is independent of translation. But Hamilton's proof does not require it to be true in every case, but only in the case of a *straight* line. Hence I maintain that Hamilton's reasoning is perfectly correct, and his proof valid.

ELWARD GEOGHEGAN

Bardsea, March 26

GEOLOGY OF CENTRAL AFRICA

THE following extract from a letter received by Mr. Geikie from Mr. Henry Drummond, who is at present exploring the Lake region, may interest our readers:—

"Maramoura, Central Africa, November 1, 1883

"I have now completed a traverse from the mouth of the Zambesi, by way of the Shire highlands, in a north-west direction, until the line joins Mr. Joseph Thomson's route, about half way between Lakes Nyassa and Tanganyika. I have filled in the geology so far as is possible in a single survey, and hope thus to be able to extend the sketch geological map, begun by Thomson, for some distance south and west. I may still further extend this by an expedition to Lake Bangweolo, after the rainy season, but there are circumstances which may make it necessary for me to leave for home in February or March. Perhaps the most interesting thing I have to note is the discovery here of a small but rich bed of fossils. The

strata alluded to consist of light coloured limestones and shales, with beds of fine gray sandstones, and the fossils include plant, fish, and molluscan remains. Plants are the most scarce, but fish-scales and teeth exist in vast numbers. Unfortunately whole fish are extremely rare, and after three or four days' search I have only succeeded in securing two or three indifferent specimens. The mollusks, on the other hand, are obtainable in endless quantity, and are in fine preservation. Indeed there is one small bed of limestone entirely made up of these remains, all, however, belonging to a single species. From the general character of the beds I am inclined to think they are of lacustrine origin. These fossiliferous beds are the only sedimentary rocks I have crossed between the mouth of the Shire—say 130 miles from the coast—and the centre of the Nyassa-Tanganyika plateau. At the point where I crossed them they are not more than a couple of miles in breadth, and are flanked on either side by granite and gneiss. They lie at a short distance from Lake Nyassa, and are probably part of the Mount Waller series. This series stretches for some short distance along the north-west shore of the lake, but is apparently of no great extent. These deposits may possibly throw some light on the problem of the lake.

"As regards the controversy between Mr. Thomson and Mr. Stewart about (1) the Livingstone Mountains, and (2) the bed of iron between the lakes, I should say that on both points both explorers are right from their own point of view.

"Mr. Stewart had only been dead a few days when I reached the north end of Nyassa. It was a great disappointment and blow to me, as I looked forward to much help from him. No one living possesses anything like his knowledge of the physical geography of this part of the interior."

CHINESE PALÆONTOLOGY

PALÆONTOLOGY is not a study that commends itself to the attention of Chinamen. With archæology the case is different. That is a pursuit which within historical limits the Chinese follow with enthusiasm. Every one who possesses any pretensions to culture, and who can afford to indulge the inclination, collects all that is old from cracked china to coins. So prevalent is this taste, and so keen is the competition for objects bearing the stamp of age, that a flourishing trade, such as rivals the celebrated traffic in "antiquities" carried on at Jerusalem, exists in fabricated antiques for the benefit of inexperienced native collectors and foreign purchasers. But natural antiquities are, speaking generally, left unnoticed, or if thought of for a moment are hastily explained by random conjectures. Topsy's celebrated explanation of her existence is about on a par with the guesses which are hazarded by the most learned Chinamen to account for palæontological phenomena. Science has always a borderland of unsolved questions, but in China this borderland exceeds in extent the territory of knowledge in the possession of the people. They have no aptitude for palæontology, and few writers make any reference to it. Among the rare exceptions to this rule is Chên Kwah of the Sung Dynasty (A.D. 960-1127), who, in an interesting work entitled "Notes from a Dreamy Valley," has collected a number of facts on natural antiquities as well as on other matters. His knowledge is not deep, but when we remember that Voltaire accounted for the presence of marine shells on the top of the Alps by supposing that pilgrims in the Middle Ages had dropped them on their way to Rome, a great deal may be forgiven a Chinese writer of the eleventh century.

The Chinese have so completely lost sight of the possibility of the existence in China of any civilisation but their own that when they meet with traces of earlier man they attribute them either to blind chance or to