

again; how much information this will convey to a student we leave our readers to judge. The answers to the various questions which are asked on the sextant are far better than the definitions, as are also the answers to the questions on cyclones. The questions on the deviation of the compass, for masters' certificates, are also fairly well answered, although a little further explanation of Napier's diagram, which forms the frontispiece, might have been given with advantage.

For reference to the questions given, the book will no doubt be very useful to intending candidates, but the answers given are good examples of the system of cramming for examinations, which cannot be too strongly condemned.

Guatemala: The Land of the Quetzal. By William T. Brigham. (London: Fisher Unwin.)

MR. BRIGHAM, an American author, has made three journeys in Guatemala, and in the present volume he has brought together all that seemed to be important in the notes written during his travels. The work is one of great interest, and ought to be not less welcome to the general reader than to persons who have special reasons for studying the subject. Mr. Brigham is a keen observer, and records his impressions clearly, simply, and effectively. No one who, in imagination, attends him in his course across the continent to Coban, from Coban to Quezaltenango, from Quezaltenango to the Pacific, will fail to be attracted by what he has to say about the physical features of the country and about the manners of its inhabitants. There are also excellent chapters on Guatemala city, and on Esquipulas and Quirigua. A sufficiently full account is given of the vegetable and animal productions of Guatemala, and of its earthquakes and volcanoes. In an introductory chapter, Mr. Brigham has something to tell us about Central America generally, and it may be worth noting that these regions will one day, in his opinion, be "the garden and orchard of the United States, not necessarily by political annexation, but by commercial intercourse." Great care has been taken to secure the accuracy of the illustrations, most of which are direct reproductions from negatives.

LETTERS TO THE EDITOR.

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Weismann's Theory of Variation.

I THINK it may be reasonably objected to Mr. Cunningham's ingenious *reductio ad absurdum* of Weismann's theory, that because we cannot exactly state what happens in the mysterious fusion of sperm- and germ-nucleus, it by no means follows that such fusion does not largely account for the observed variation. I say largely, because Prof. Weismann's more recent paper, "Ueber die Zahl der Richtungskörper und über ihre Bedeutung für die Vererbung" (Jena, 1887), completes in a most important manner the paper quoted and criticized by Mr. Cunningham.

The argument is briefly as follows. The expulsion of the second polar body by sexual eggs is the removal of half the ancestral germ-plasms in order to make room for those which are added in fertilization. For this reason we must suppose that an equivalent reduction of the sperm-nucleus also takes place. If this reduction did not occur, the number of germ-plasms would be doubled in each sexually-produced generation—an unthinkable result.

If there were only one kind of germ-plasm in each nucleus, and sexual reproduction commenced, there would be 1024 distinct germ-plasms in each of them at the end of ten generations. But the number of generations must be so vastly in excess of ten that the number of ancestral germ-plasms in each sperm- and

germ-nucleus must be considered to be infinite, or at any rate so large that the expelled halves would never be the same. It therefore follows that no two sperm- or germ-nuclei can be alike, and individual variation must follow. A little consideration also shows that while the children of the same parents must differ, they must also resemble each other more than the children of other parents, and while they must differ from their parents they must also resemble them more than the parents of other children.

The occurrence of atavism may be explained as a direct consequence of an unusual predominance of ancestral germ-plasms; the fact that atavism is a rare exception also follows from the fact that the expulsion of half the germ-plasms in each generation will nearly always prevent such predominance.

It is impossible to carry the subject further in the scope of a letter, or one might refer to the evidence for the absence of variability in parthenogenetic species, in which the second polar body is not expelled from the ovum; and to the identity of twins produced from a single ovum which has presumably divided after fertilization.

E. B. POULTON.

Oxford.

A Correction.

WITH reference to my communication in last week's NATURE, Prof. Oliver Lodge has called our attention to the fact that we had made a mistake in stating that the wave-length of the vibration was 33 centimetres. It is the semi-wave-length that is 33 centimetres; the wave-length is 66 centimetres, as is evident on consideration of the size of the "vibrator."

FRED. T. TROUTON.

Temperature Observations in Rivers.

THE Committee appointed at the Bath meeting of the British Association to investigate seasonal variations of temperature in rivers and streams was able to arrange through local scientific Societies for thirty observers, commencing work in January 1889. Of these there are ten in England, ten in Scotland, and ten in Ireland. Each observer is supplied with a specially designed thermometer (costing 2s. 6d.) which has been compared with a standard instrument, and books for recording the observations and full instructions are provided by the Committee. It is desirable to extend the observations to rivers not yet taken up, and I therefore wish to direct the attention of local scientific Societies, of meteorological observers and others interested in similar work, to the opportunity now offered of taking part in a systematic investigation, the preliminary results of which show many interesting features. I shall be pleased to answer any inquiries of intending observers.

HUGH ROBERT MILL,

Secretary Brit. Assoc. Committee.

Heriot-Watt College, Edinburgh, February 20.

"Bishop's Ring."

IN your review of the Report of the Krakatão Committee of the Royal Society, it is stated that "Bishop's ring" has quite disappeared. Now this is hardly correct, for although I have not heard of anyone perceiving it in the middle of the day for a long time past, it is still visible about sunrise and sunset, though becoming on the whole gradually fainter. I presume that it is really the same phenomenon. At the time when "Bishop's ring" was most conspicuous in the full day-time, it was always far more so when the sun was rising and setting.

Sunderland, February 20.

T. W. BACKHOUSE.

Peripatus in Australia.

Peripatus has been found not only in Queensland and Victoria, but also at Cassilis, in New South Wales, by Mr. A. S. Olliff, of Sydney. The Victorian and New South Wales localities are recorded in a postscript appended to my monograph of the genus as reprinted from vol. iv. of the "Studies from the Morphological Laboratory of the University of Cambridge." My knowledge of it is due to Mr. Olliff, who was kind enough to send me his specimen and his description of it (Proc. Linn. Soc. of