

## VON ZITTEL'S HISTORY OF GEOLOGY.

SIR,—I am one of those who in consequence of your notice in the April number at once sent for the translation of Von Zittel's History of Geology, etc. I read it with avidity, and can endorse all that was said about the book. Specially was I interested in the masterly manner in which the subject of metamorphism, the discussion on the Cambrian and Silurian systems, the *Eozoon Canadense*, the North-West Highlands of Scotland, and the unravelling of the Alpine strata were treated, with the various points still open for investigation.

There are, however, on p. 159, which contains statements as to the diameter of the planets, and on p. 168, where the thickness of the solid crust of the earth is dealt with, also on p. 300, where the shortening of the earth's radius is mentioned, figures given which I do not understand. The writer or the translator must have had some modulus of dimension in mind different from any of those stated in the text. It would be well before a second edition is produced that these points should be reconsidered.

The following are the clauses remarked upon:—

Page 159: "Of the six planets that were known in early astrology, Mercury is nearest the sun in position, and has itself a diameter of 648 miles; Venus (diam. 1,613 miles) follows Mercury, then the Earth (diam. 1,719 miles), then Mars (diam. 909 miles), Jupiter (diam. 19,000 miles), and Saturn (diam. 16,675 miles). Herschel in 1780 discovered on the farther side of Saturn the planet Uranus with a diameter of about 8,000 miles, and Leverrier in 1846 discovered by mathematical calculation the outermost planet, Neptune, with four and a half times the diameter of the Earth."

The ordinary textbooks give—Mercury, 2,000 miles diameter; Venus, 7,600; Earth, 7,928; Mars, 4,430; Jupiter, 86,000; Saturn, 76,246; Uranus, 32,000; Neptune, 35,000.

Page 168: "Hopkins calculated that the solid crust of the earth had a thickness of about  $\frac{1}{4}$  or  $\frac{1}{5}$  of the earth's diameter, that is, at least 172 to 215 geographical miles."

Page 300: "Delesse had calculated 1,340 metres as the amount by which the earth's radius had already been shortened; in other words, the earth's crust in the course of the geological epochs had approached the earth's centre by a distance about equal to the height of Chimborazo or the Himalayas above sea-level."

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THE LIMITS OF LEGITIMATE SPECULATION AT THE  
GEOLOGICAL SOCIETY.

SIR,—Early in 1900 I submitted to the Geological Society a short paper on Bala Lake and the rivers of North Wales, in which I attempted to show that the great valleys which run through North Wales from north-east to south-west had probably been

formed by earth-movements, and had produced a great effect upon the river-system. In the discussion which followed this view was severely criticized by Mr. Strahan, and was characterized by him as highly speculative.

A few months ago Mr. Strahan read at the Geological Society a paper on the rivers of South Wales; and in this he makes the suggestion, quite as if it were new, that the north-east to south-west valleys are due to earth-movements, and that the complications of the drainage system have been produced by these movements.

My paper was rejected by the Council<sup>1</sup> as too speculative: Mr. Strahan's has just been published in the Quarterly Journal.

To those Fellows who are not familiar with Burlington House, I commend a comparison of these two papers.

PHILIP LAKE.

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MR. STRAHAN AND SOME ENGLISH RIVERS.

SIR,—In his suggestive paper "On the Origin of the River System of South Wales, etc.," in the recently published May number of the Quart. Journ. Geol. Soc., Mr. Strahan states (pp. 219–220) that "The [Chalk.] escarpment, in that part of it which extends from Dorset to the borders of Hertfordshire, diverges from the water-parting three times, namely, in the Vales of Wardour and Pewsey and in the valley of the Upper Thames. In *all* these cases, rivers rising in the low-lying Oolitic region flow eastward against the general run of the country, and make their way through the Chalk-escarpment to the Thames or Frome. The explanation did not escape Ramsay. *Their courses were initiated upon an eastward slope of Chalk, and the distance from their sources to the existing escarpment is a measure of the recession of the escarpment since the initiation.*"

With respect to this passage (in which the italics are mine) I should like to point out (1) that the river running eastward through the Vale of Pewsey does not rise "in the low-lying Oolitic region," but in a tract of Chalk and Upper Greensand to the east of and some 200 feet above it. (2) That inasmuch as the rivers traversing the Vales of Wardour and Pewsey follow the axes of minor east-west anticlinal folds, they are to be regarded rather as longitudinal, autogenetic branches of the north-south Salisbury Avon, than as primary, or consequent, eastward streams of the Upper Thames class. Unlike the Upper Thames, the Kennet-Thames, or the Frome, which follow the slopes of constructional troughs, these streams (i.e. the Nadder and Upper Avon) can only have come into existence after prolonged denudation of the folds on which they are situated. It is, therefore, scarcely probable that their present sources were determined by, or, indeed, are in any

<sup>1</sup> I owe it to the GEOLOGICAL MAGAZINE that the article subsequently saw the light (May and June, 1900).