none of them have as yet, to my thinking, been traced to an issue; and to show the direction in which I hope myself to contribute.

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CURRENT NOTES ON PHYSIOGRAPHY.

RIVERS OF SOUTHERN INDIANA.

CERTAIN recent essays that might be gathered under the general title, 'Studies of River Development,' are of interest beyond that which concerns the locality that they treat, inasmuch as they illustrate the degree to which one of the most important divisions of physiographic theory finds practical application.

The 'Drainage of Southern Indiana,' largely outside of the glaciated area, is explained by Newsom (*Jour. Geol.*, Vol. X., 1902, pp. 166–180, map) as 'such as would be logically developed in a country of such combination of hard and soft southwestward dipping strata' as are here found; that is, there are two north-south cuestas formed by the Niagara limestone and the Knobstone standstone, with respect to which the streams are rather systematically arranged, in what seem to be consequent, subsequent and obsequent courses. The author implies an improbably close agreement between the original extent and the present outcrops of certain formations in suggesting that a certain stream, which follows a longitudinal course on weak strata, was deflected into such a course by the sandstones of the next west-lying cuesta when the 'region was first elevated.' The explanation offered for the behavior of one of the master consequents (East White river) in gathering a number of branches from the back (western) slope of the low Niagara cuesta and leading them westward through a notch in the next following Knobstone cuesta, would have been strengthened if it had been presented as exemplifying a type-pattern of drainage well known elsewhere. Indeed, inasmuch as this essay is addressed to professional readers, the essential features of the streams might have been more tersely presented in several instances, had they been named in accordance with a consistent terminology and thus shown to belong to well-recognized classes, rather than described in paraphrases as if they had no relatives elsewhere. The close approach of the Ohio to one of the headwaters of East White river seems to indicate a great and relatively recent increase in the volume of the Ohio, such as has been inferred from other evidence elsewhere.

RIVERS OF SOUTH WALES.

THE most notable characteristic of Strahan's 'Origin of the River-system of South Wales' (*Quart. Journ. Geol. Soc.*, LVIII., 1902, 207–225, map) is the neglect of the capture of headwaters of initial consequent streams by the growth of associated subsequent streams along belts of weak strata. It is shown on good evidence that many streams in the Paleozoic area of South Wales pay no attention to the strong east-west folding or to the pronounced north-northwest faulting of the region; and it is reasonably inferred that they were superposed on the previously much denuded Paleozoic area through a cover of Chalk; but in certain localities where the streams follow a northeast-southwest system of disturbances, a late date is given to the disturbances and the streams are made locally consequent upon them. It is recognized that since superposition there has been great denudation, whereby strong relief has been developed appropriate to the resistance of the rocks; but no accompanying adjustment of streams to structures (except in an altogether minor case) is considered, although it is rather clear that a number of captures must have taken place, as in the growth of the Usk headwaters on the Old Red sandstones north of a resistant Carboniferous escarpment and in the associated beheading of several streams south of the Usk. The theory of the adjustment of streams to structures is altogether too well demonstrated to be set aside as 'transgressing the limits of legitimate speculation.' Yet in accordance with the tacit postulate that all rivers are of consequent origin, Strahan reverts to Ramsay's theory of an anticline to form the divide between the Thames and the Severn. Much of the evidence against this obsolescent solution of the Thames-Severn

problem is presented in a somewhat polemical reply by Buckman, entitled 'River Development' (*Geol. Mag.*, Vol. IX., 1902, pp. 366–375).

DISSECTION OF LACCOLITHS.

AN ingenious use of physiographic methods has been made by Jaggar in discussing the former size of the laccolith of which the famous butte, Mato Tepee, northwest of the Black Hills, is believed to be a remnant (The Laccoliths of the Black Hills,' 21st Ann. Rep. U. S. Geol. Surv., Pt. III, pp. 163–303). Successive stages in the dissection of laccoliths are summarized about as follows: An early stage produces a dome-shaped hill with radial drainage. One radial stream gains advantage over its fellows and eats out the soft stratum beneath the central portion of the dome; the outward dipping hard beds are undermined and drainage formerly radial outward (consequent) becomes radial inward (obsequent); a former mountain becomes a quaquaversal basin inclosed by a horseshoe ridge. Recession of this ridge and continued erosion on the soft bed uncover a deeper dome of harder rock. Monoclinal shifting of the streams on the soft bed becomes easier than deep cutting into the dome, and thus an encircling (subsequent) valley is developed with a new series of radial streams (resequent) from the stripped mountain core. This alternation from mountain to basin will continue until the igneous mass is discovered; if its upper surface is strongly convex, monoclinical shifting will withdraw the encircling valley from it, leaving an igneous dome with radial ravines; if the upper surface is but slightly convex, the innermost annular streams may be superposed on the laccolith somewhat within its periphery; and still later they may be superposed on the bedded rocks beneath the laccolith. The last condition is thought to occur around Mato Tepee, whose bold column is therefore interpreted to be the remnant of a laccolithic sill about a mile and a half in diameter. W. M. DAVIS.

SCIENTIFIC NOTES AND NEWS.

DR. CHARLES S. MINOT, professor of histology and embryology in the Harvard Medical School, was given the degree of Doctor of Science at Oxford University, on the occasion of the tercentenary of the Bodleian Library.

WE learn from the *Naturwissenschaftliche Rundschau* that, on the occasion of the jubilee of Abel at Christiania, the honorary doctorate was conferred on the following German mathematicians: Professor Georg Cantor (Halle), Professor J. W. R. Dedekind (Brunswick), Professor David Hilbert (Göttingen), Professor Felix Klein (Göttingen), Professor Leo Königsberger (Heidelberg), Professor H. A. Schwarz (Berlin), Professor Heinrich Weber (Strassburg), Professor Ludwig Blotzmann (Vienna).

AT the first autumn meeting of the American Academy of Arts and Sciences, of Boston, Professor Luigi Cremona, of Rome; Professor J. J. Thomson, of Cambridge, England; Professor Emil Behring, of Marburg, and John Morley, Esq., of London, were elected foreign honorary members; and President Hadley, of Yale University, was elected an associate fellow. President Agassiz gave an account of his observations on the coral reefs of the Maldives in the Indian Ocean, and Mr. H. H. Clayton spoke on the observed movements of the dust from the volcanic eruptions in the West Indies and their bearing on theories of atmospheric circulation.

DR. S. P. LANGLEY, secretary of the Smithsonian Institution, has returned to Washington from Europe.

MR. FREDERICK V. COVILLE, of the Department of Agriculture, has returned to Washington from a botanical expedition to the Klamath country, Oregon. It is understood that a part of his work has been ethno-botanical.

V. I. JOCHELSON, one of the explorers of the American Museum of Natural History, has arrived at Moscow on his way to New York. He has been making ethnographical studies and collections in the Amur and Yakoust territories for two years.

PROFESSOR B. E. FERNOW, professor of forestry of Cornell University, has been requested to advise the New York park commissioners as to the best policy to pursue in regard to the trees in Central Park, which are thought to be suffering from lack of sufficient earth.