

volcanic series, and of rocks which may have been associated with it, and they contain a series of conformable conglomerates of which the porphyries of Llyn Padarn are members. They are the seen to the east, and have not The porphyries of Llyn Padarn eous lava-flows in the midst of the Cambrian series, the overlying conglomerates being derived from them and from the sedimentary Cambrian rocks to the west; and hence there is no certain proof of there being any Precambrian rocks in the whole district, though it is probable that the rock near Caernarvon belongs to an epoch distinct from and anterior to the Cambrian.

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II.—January 11, 1888.—Prof. J. W. Judd, F.R.S., President, in the chair.—The following communications were read:—

1. "On the Law that governs the Action of Flowing Streams." By R. D. Oldham, Esq., F.G.S.

The author, after describing how his attention was drawn to the subject, proceeded to an investigation of the law that governs the action of a flowing stream. Having accepted as a fundamental principle that the velocity of a stream will always tend to become such as is just sufficient to transport the solid burden cast on to the stream, and pointed out that the principle is almost axiomatic in its nature, he finds that, where untrammelled by exterior conditions, a stream will be alternately confined to a single, well-defined, deep channel, and spread out into a number of ill-defined, shallow channels, the former being defined as a "reach," the latter as a "fan," that the gradient in the "reach" is less than in the "fan," and that both "reach" and "fan" will continually be encroaching at their upper ends, and being encroached upon at their lower ends.

After detailing some general considerations which show that what should occur according to hypothesis does actually occur in nature, he indicated that the accurate and detailed levels taken in connexion with the Ganges Canal do actually show this alternation of "reach" and "fan," that the gradients are higher in the latter, as they should be, and that the records of the Canal show the retrogression of "fan" and "reach" demanded by the hypothesis.

Accepting this agreement of fact with hypothesis as proof of the correctness of the latter, it follows that the fundamental principle on which it is founded is correct, and that, in the absence of interfering causes of greater potency, it is the coarseness or fineness of the débris cast upon a stream that will determine its gradient and velocity, and not, as stated in text-books, the velocity of a stream that will determine its gradient and the coarseness of the débris transported by it:—a conclusion that might be arrived at independently, from the fact that it is in the upper reaches of a stream, where coarse débris prevails, that high velocities of current prevail, while in the lower reaches, where the débris is finer in grain, the velocity of current is also diminished.

2. "Supplementary Notes on the Stratigraphy of the Bagshot