

a nearly constant direction, but at intervals they are subject to abrupt changes of direction so as to form a series of zigzags with sharp elbows. In places the faults run in parallel lines, the ends overlapping for short distances. All scarps, which are not much worn away, are steeply inclined and appear to be the continuations of nearly vertical faults. The highest measured vertical displacement along any scarp is 23 feet. Abrupt variations, and even reversal in throw are, however, occasionally seen. Horizontal displacements were also observed, though the evidence of such displacements is now almost obliterated. One of 15 feet towards the north was measured by Gilbert eleven years after the earthquake, and another of 9 feet was photographed by Mr. Johnson.

C. D.

### III.—BRIEF NOTICES.

1. "THE SAND-DUNES OF THE LIBYAN DESERT" are described and illustrated by Mr. H. J. Llewellyn Beadnell (*Geograph. Journ.*, April, 1910). In his opinion the material has been derived from the arenaceous formations of post-Middle Eocene age that lie to the north. The dunes consist mainly of silica, but in places they contain rather more than 7 per cent. of limestone granules. As the author remarks, "In some localities extensive and prosperous settlements have been overwhelmed and blotted out of existence, while in others the sand and dust-laden winds have been of positive benefit to the inhabitants. In the south part of the oasis of Kharga, for instance, broad terraces of cultivable loam have been gradually built up in the neighbourhood of the wells, the deposition of the wind-borne material being encouraged on account of its valuable fertilizing properties." The subject is therefore of considerable economic importance as well as scientific interest. The author's observations show that the dunes progress steadily southwards at an average rate of 15 or 16 metres a year.

2. LANDSLIDES IN THE SAN JUAN MOUNTAINS, COLORADO, form the subject of a memoir by Mr. Ernest Howe (Professional Paper 67, U.S. Geol. Survey, Washington, 1907). It is well illustrated, and contains much information of general interest and importance.

The topography of the San Juan Mountains is described as "that of a dissected and glaciated plateau of more or less horizontally bedded volcanic rocks resting upon a foundation of sedimentary rocks". The oldest rocks, which are pre-Cambrian, are covered unconformably by various Palæozoic and Mesozoic formations, and by the Telluride conglomerate that is perhaps of Eocene age. The Tertiary volcanic rocks, with an aggregate thickness of "many thousands of feet" in the central part of the mountains, rest on the Telluride conglomerate or on a floor of older rocks, the dip of which is southerly, westerly, or northerly. Various forms of rock-falls, landslips, and soil-slips are described, all the rocks being liable to be affected. The superficial movements of the ground comprise earth-slides or soil-slips, mud-flows, and talus slumps. Other movements, though less common, are due to movement along bedding-planes in the direction of the dip. The primary jointing and secondary shattering of the rocks has led to

rock-falls. Further, the oversteepness of the valley-walls that existed in a great many places after the final retreat of the ice of the Glacial epoch has had a potent influence on landslides. Earthquakes in some instances have been the immediate cause of the breaking away of rock-masses.

The author draws particular attention to 'rock streams', which have certain features in common, both with landslides and ordinary talus. In general appearance these accumulations resemble long tongues or lobes of talus stretching far out from the base of the cliffs from which they were derived, over the nearly level or gently sloping floors of the glacial cirques. The deposits are usually bounded by a sharply defined steep front; their surfaces are marked by irregular hummocks or wave-like ridges; and the material consists of angular blocks of rock, averaging about one foot in diameter, with finer and coarser material. They characterize tracts where the rocks are much shattered. Ice and snow may have influenced the formation of these rock-streams, but the author "believes that they are strictly landslides and owe their present form entirely to the nature of their fall and to the character or physical condition of the rocks involved in the fall". They appear in the main to be due to the rapid slipping of surface material.

3. THE JOURNAL OF GEOLOGY (Chicago) maintains its reputation for original essays on subjects of wide interest and importance. In the number for May-June, 1910, Mr. E. S. Bastin writes on the "Origin of the Pegmatites of Maine", and concludes that the broader field-relations suggest that the large areas characterized by pegmatite intrusions constitute in reality the roofs overlaying granite batholiths. Mr. S. R. Capps, jun., deals with the "Rock Glaciers in Alaska". These are formed of angular talus and occupy cirques, or the bottoms of cirque-like valleys, that were excavated at the time of the maximum glaciation of the region. Small glaciers still exist at the heads of some of the valleys, but in most cases conditions for ordinary glacial activity have ceased, the winter's snows having all melted away during the summer. The base of the talus, however, has been filled with interstitial ice, and the movement of the mass in a glacier-like way has continued. In some respects these 'rock glaciers' are allied to the 'rock streams' described by Mr. Ernest Howe as essentially due to surface landslides. In the number for July-August, Mr. H. M. Eakin contributes an article on "The Influence of the Earth's Rotation upon the Lateral Erosion of Streams"; and Mr. R. E. Hore writes "On the Glacial Origin of Huronian Rocks of Nipissing, Ontario".

4. AMERICAN PHILOSOPHICAL SOCIETY.—In the Proceedings for January to April, 1910 (vol. xlix, pp. 57-129) there is an important memoir by Mr. W. H. Hobbs on "Characteristics of the Inland Ice of the Arctic Regions". The author contrasts the physical conditions of the North and South Polar areas, and the differences between mountain and continental glaciers. The ice-cap glacier, while of smaller dimensions than the true inland ice or the continental glacier, is regarded as distinctly allied with this type, having few affinities with mountain glaciers. Descriptions are given of the ice-cap glaciers of Norway and Iceland, of the ice-covered archipelago of Franz Josef

Land, of the inland ice of Spitzbergen, and of the continental glacier of Greenland. The englacial and subglacial drainage, the marginal lakes, the fresh water or 'submarine wells' in fiord heads, and the discharge of bergs, are likewise described; and the subject is well illustrated by diagrams and pictorial views.

In the number for July, 1910, Mr. W. J. Sinclair records the discovery of bones of *Paramylodon* in the Pleistocene asphalt deposits near Los Angeles. Mr. T. J. J. See gives the "Results of Recent Researches in Cosmical Evolution", believing that the planets were developed in the solar nebula, and that our moon was originally a planet which became a satellite, but was never part of the terrestrial globe.

5. We have received a copy of the sixth edition of the useful *Tables for the Determination of Minerals by Physical Properties*, by Dr. Persifor Frazer and Professor A. P. Brown. (London and Philadelphia, J. B. Lippincott Co., 1910.)

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## CORRESPONDENCE.

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### YORKSHIRE GEOLOGISTS AND EDITORS.

SIR,—Would the Hull Geological Society kindly inform us of what possible use it is to publish generic names under the combinations of letters quoted below?

|         |       |        |        |
|---------|-------|--------|--------|
| Psil.   | Cor.  | Ast.   | Echi.  |
| Cal.    | Agas. | Nicro. | Der.   |
| Schlot. | Arn.  | Ambly. | Polym. |
| Ver.    | Arie. | Oxyn.  | Upt.   |

We doubt whether one person in a hundred has the remotest idea what they mean. It is impossible for the Recorder to waste his time looking them up, and work presented in such a way can only be disregarded.

While in the critical mood we should also like to ask whether the table on the distribution of *Belemnites* in the Lias is the result of personal collecting or of collation of printed data? If the latter, it is of little value. If the former, it would be interesting to know who is the authority for the determination of Simpson's species. What really valuable work Yorkshire geologists might do if some competent man would go and draw and describe Simpson's types in the same way as Mr. Buckman is doing for the Ammonites!

RECORDER.

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### LYME REGIS CHURCH.

SIR,—The ancient and historic church of St. Michael, Lyme Regis, which is a good example of fifteenth century Perpendicular Gothic, is in danger owing to the encroachment of the sea. The cliffs of the district are of Blue Lias and crumble readily. Many can remember when two fields stretched between the churchyard and the edge of the