## CURRENT NOTES ON PHYSIOGRAPHY.

### DIKES AS TOPOGRAPHIC FEATURES.

DIKES are so generally the exclusive property of geological study that a good illustration of their topographic value is a welcome novelty. Rocky walls, shown by the removal of the weaker country rock from a vertical dike, have been occasionally mentioned in the reports of western surveys, but the finest example of the kind yet published is to be found in the Spanish Peaks (Colorado) folio of the U. S. Geological Survey, by Hills. Here a great number of dikes, arranged in a roughly radial pattern with respect to the denuded stocks of the Spanish peaks as a center, form numerous walls from 50 to 100 feet in height, stretching more or less continuously for five or ten miles or more. The weak horizontal Tertiaries have been worn away; but the dike wall retains some mark of their bedding, just as a casting shows the form of its mould. Several excellent photographic illustrations are appended; they are destined to frequent reproduction as type examples of this relatively rare class of topographic forms.

### THE PLAIN OF ST. LAWRENCE VALLEY.

THE lower St. Lawrence valley is a broad and nearly level plain of post-glacial marine clays and sands, concerning which R. Chalmars gives some interesting information ('Notes on the Pleistocene Marine Shore-lines and Landslips of the North Side of the St. Lawrence Valley,' Geol. Surv. Canada, Ann. Rep., XI. (1898), 1901, 63J–70J). The height of the plain seldom exceeds 15 or 20 feet along the river bank, but it increases towards the valley sides, and reaches 400 or 500 at the base of the Laurentide hills. The junction of the plain with these hills forms a very irregular line, often running up the river valleys in loops for considerable distances. Generally speaking, this line can be traced approximately on a good map by the absence of lakes on the marine area, whereas on the Laurentide area lakes are quite numerous. Occasionally the surface of the plain is seen to ascend by steps, each of which has apparently been a shore-line during the emergence of the plain from beneath the sea. Terraces and beaches occur on the hill slopes above the plain; the highest reach altitudes of more than 800 feet.

Certain parts of the plain are subject to extensive landslips, apparently due to the sliding of water-logged silts into valleys that have been cut into the plain since its elevation. One in 1840 left a depression with a maximum depth of 30 feet below the adjoining plain over an area of 84 acres in the valley of Maskinongé river; this was described by Logan (*Proc. Geol. Soc.*, London, III., 1842, 767–769). The St. Albans landslip occurred in 1894; here the clays and sands slid bodily into the valley of the St. Anne de la Pérade for the space of 3½ miles, leaving a depression a mile wide and averaging 100 feet deep. (See Laflamme, *Trans. Roy. Soc. Canada*, XII., 1894, 63; and Archibald and Mackenzie, *Railroad Gazette*, N. Y., June 29, 1894.) The most recent large slip occurred in the valley of Rivière Blanche in 1898, leaving a depression over 86 acres in area with a maximum depth of 28 feet. The softer material flowed out from underneath, while the upper and more coherent clay split into blocks and columns which were borne away by the sliding, surging mass. The movement continued for three hours; clay masses being then left stranded on the floor of the depression, while the mud flow spread over the valley to a depth of twenty-five feet or more for nearly two miles. Accounts of this slip have been given by Dawson (*Bull. Geol. Soc. Amer.*, X., 1899, 484–490) and Laflamme (Rep. Comm'r Col. and Mines, 1898, 131).

### THE QUESTION OF PENEPLAINS.

DE LAPPARENT considers the origin of several peneplains in France as determined by geological evidence ('La question de pénéplaines envisagée à la lumière des faits géologiques.' *Verh. 7ten Internat. Geogr. Kongr.* (1899), Berlin, 1901, II., 213–220). It is here not a question as to the occurrence of peneplains, now more or less uplifted and dissected; the French examples of this class of forms are so striking that the author does not regard their verity as a matter open to discussion. It is only their origin that he studies. The peneplains more fully described are found in the Ardennes, Brittany, and the Central Plateau. Strati-

graphic evidence leads to the conclusion that these regions have repeatedly been land areas, and that the successive invasions of the sea found the lands so low and flat as to offer no scarps for the sea to work upon. Regarding Brittany, it is remarked that littoral deposits somewhat to the north (bordering the Cotentin) have been produced in the same neighborhood and at altitudes differing only by a few meters during eleven different periods beginning with the Trias, thus indicating an astonishing stability of this region during the time of its denudation to the peneplain form. Marine erosion is therefore excluded, and the peneplains are ascribed to subaerial denudation.

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## *RECENT ZOO-PALEONTOLOGY.*

### FOSSIL REPTILES OF EUROPE.

THE latest paper upon the *Pterosaurs* is by Dr. Felix Plieninger.* Dr. Eberhard Fraas† proposes the name *Thalattosuchia* as a new group of marine crocodiles of the Jurassic formation, differing widely from all others in the extreme adaptation for aquatic life, especially in the total disappearance of the dermal armature and in the complete conversion of the limbs into paddles. The three chief genera *Metriorhynchus*, *Geosaurus* and *Dacosaurus* were placed by von Zittel in the family *Metriorhynchidæ*, of the suborder *Eusuchia*. But according to Fraas they deserve a wider separation, since while most nearly related to the long-snouted crocodiles (Longirostres), they by no means present a transition to the short-snouted (Brevirostres), but represent an entirely independent group, exclusively adapted to marine life. The superficial resemblance of the skull to that of Ichthyosaurs is intensified by the reduction of the characteristic crocodilian sculpture and by the ossification of the sclerotic coat of the eye. The details, however, are quite distinctive. This constitutes the fifth independent group of marine reptiles, the others being the Plesiosaurs, Ichthyosaurs, Mosasaurs and Chelonians.

* 'Palæontographica,' Vol. XLVIII., 1901.

† 'Jahresb. d. Ver. f. vaterl. Naturk. in Wurtt,' 1901, p. 408.

### MARSH'S COLLECTION OF BRIDGER MAMMALIA.

THIS unique collection of Eocene mammalia has been placed by Professors Beecher and Dana, of the Peabody Museum, in the hands of Dr. J. L. Wortman for systematic description.* As Dr. Wortman remarks, "The importance of the subject to the student of mammalogy can scarcely be overestimated, since these epochs witnessed the beginnings and branching off of many groups destined to play such a prominent part in succeeding mammalian development. This fact was fully appreciated by Professor Marsh, and he spared neither pains nor expense in making the collections as complete as possible." In the first part, on the Carnivora, Dr. Wortman proposes an important and what may prove permanent change, in grouping with the modern Carnivores all the Creodonta that are closely related to them under the new suborder Carnassidentia, and retaining the suborder Creodonta (Cope) only for the ancient types that are entirely aberrant. Valuable notes are given upon the ancestral foxes of Wyoming, and the evolution is traced as far as the Uinta. The author believes that all the placentals had a direct marsupial ancestry, not far removed from the mesozoic carnivorous marsupials. Attention may be called to the fact, opposed to this view, that all the mesozoic marsupials known have a highly specialized character, with inflected jaw and aborted milk dentition, so that they cannot be considered ancestral to the placentals. The value of these papers for future reference would be increased by the insertion of the museum numbers in connection with all descriptions and figures.

### PLEISTOCENE HORSES OF NORTH AMERICA.†

IN the preglacial sands of the west and the cave and gravel deposits of the east, remains of horses are extremely numerous; no less than twenty-five species have been proposed and the nomenclature has been in a state of dire con-

* 'Studies on Eocene Mammalia in the Marsh Collection, Peabody Museum,' Part I. Carnivora, *Amer. Jour. Sci.*, May and June, 1901.

† Tooth Characters and Revision of the North American Species of the Genus *Equus*. By J. W. Gidley. *Bull. Amer. Mus. Natural History*, Vol. XIV., Art. IX., pp. 91-141, May, 1901.