CURRENT NOTES ON PHYSIOGRAPHY (XVI.).

RUSSELL'S LAKES OF NORTH AMERICA.*

Professor Russell calls his new book 'a reading lesson for students of geography and geology.' It is appropriately dedicated to Gilbert. An opening chapter discusses the origin of lake basins, a subject which the author's own studies in the West have greatly advanced; for we owe to Russell not only the best account of a region of comparatively recent dislocations, where lakes lie in the relatively depressed areas, but also the description of such lacustrine curiosities as Moses Lake, in Washington, retained in a deep valley behind a barrier of sand dunes, and such as the two lakes that lie in basins formed by the plunge of a cataract on the temporary glacial course of the Columbia. Other chapters concern the movements of lake waters and the geological and climatic functions of lakes. The topography of lake shores is particularly well illustrated, chiefly by plates selected from publications of the U. S. Geological Survey, now placed more conveniently in the hands of teachers and students. The relations of lakes to climatic conditions, the resultant composition of their waters and the variation of their volume are fully considered. The book closes with an excellent account of certain special lacustral histories, including the pleistocene lakes of the Laurentian basin, Lake Agassiz, the pleistocene lakes of the Great Basin and certain lakes of the more remote past. If this book has the circulation that it deserves, the rising generation of geographers will greatly profit by it.

A SEICHE IN LAKE SUPERIOR.

A class of movements of lake waters, briefly treated in Russell's book, is the 'seiche,' or slow oscillation of level, long known and minutely studied in Switzerland, especially by Forel; vaguely recorded and hardly studied at all in this country. A strong seiche was observed in Chequamegon Bay, near the west end of Lake Superior, on September 11, last. It rose in a 'wall of water' about four feet high, extending across the bay and rushing in upon the low shore, where it did much damage, lifting up the logs of corduroy roads, breaking log booms and drifting the logs away, and even putting out the fires under a few steam boilers. The water gradually subsided, bearing back to the lake a confused flotsam of 'roots, grass, tree tops and other debris.' Mr. G. M. Burnham, of the Ashland (Wis.) *Daily Press*, calls my attention to the occurrence at Harbor Springs, near the north end of Lake Michigan, also on September 11, of a gradual depression of the water 'fully five feet,' followed by a gradual rise, and other minor changes of level. Although these peculiar disturbances are sometimes strong enough to break boats away from their moorings, and although the automatic records of water levels maintained by the army engineers at various lake ports show minor seiches of almost continual occurrence, no serious study of their varied phenomena has yet been undertaken.

BATHYMETRY OF THE ENGLISH LAKES.

Dr. H. R. Mill describes his bathymetrical survey of the English lakes in the July and August numbers of the (London) *Geographical Journal*, with many illustrations from photographs and an excellent series of tinted maps by Bartholomew. The view of Wastwater is a particularly good illustration of a lake in its hill-setting; not simply a sheet of water bounded by a distant shore, such as appears in most pictures of lakes. The following table presents a number of the results gained:

*Ginn & Co., Boston, 1895, 125 pages, with numerous illustrations. Price, $1.65.

Lake.	Length. miles.	Area, sq. m.	Elevation.	Depth.	
				Max.	Mean.
Windermere.	10.50	5.69	130	219	78½
Ullswater.	7.35	3.44	476	205	83
Wastwater, ...	3.00	1.12	200	258	134½
Coniston Water....	5.41	1.89	143	184	79
Crummock Water.	2.50	0.97	321	144	87½
Ennerdale Water..	2.40	1.12	368	148	62
Bassenthwaite	3.83	2.06	223	70	18
Derwentwater	2.87	2.06	244	72	18
Haweswater.....	2.33	0.54	694	103	39½
Buttermere	1.26	0.36	329	91	54½

Derwentwater and Bassenthwaite belong together as a shallow lake, divided by an alluvial flat; their average depth being only 18 feet, and this average being only a quarter of their maximum depth. The other lakes form a deeper group, whose average depth is 40 feet, while the average depth of each one varies from 36 to 61 per cent. of its maximum depth. The best examples of this class lie in long narrow valleys with steeply sloping sides, the slopes being continued under water and terminating on a flat bottom. The lakes as a whole reach just as far as and no farther than the beginning of the more level country which skirts around the highland.

DIURNAL VARIATION OF RIVER VOLUME AND VELOCITY.

PROFESSOR BRÜCKNER, of Berne, contributes a review of numerous observations on the rivers of Switzerland to Petermann's *Mitteilungen* (June and July, 1895,) which result in showing that all the streams heading in regions of melting snow or ice have perceptible diurnal fluctuations in volume and velocity. These are noticeable in the Arve to the city of Geneva, the Rhone to its mouth in Lake Geneva, the Aar to Lake Brienz, the Reuss to Lake Lucerne, especially in midsummer; the wave of high water advances down stream at a rate of three or four meters a second. Side streams entering a trunk river at different points tend to confuse the high water wave, but fail to obliterate it. While a particle of ice requires decidedly more than a century to move from the summit of the Jungfrau to the foot of the Aletsch glacier, 29 km., only twelve hours are needed for the water to flow from the glacier down the Rhone to Lake Geneva, where it remains on the average about eleven years before resuming its journey to the Mediterranean.

GEOGRAPHY IN NORMAL SCHOOLS.*

TEACHERS of geography in normal schools will do well to consider Mr. Murdock's plan of work at Bridgewater; not so much because it can be immediately applied elsewhere as because of the importance that it attaches to local observation in geographical study, and because of the large share of attention allowed to questions of origin, structure, denudation and the like, which are too often left to one side, as if fenced off in a geological field where the geographer must not trespass. Many references are made to good materials. On the other hand, the fault of too much method, thought by many educators to be characteristic of normal schoools, occasionally appears; as in such a definition as "A picture of an object is the representation on a surface of the appearance of an object." Any scholar in a normal school who needs this definition cannot be ready for serious geographical study. So sententious a truism as "Geographical objects within the range of vision must be observed; the product of of the observation is knowledge," is another sign of those normal school methods in which a diluted psychology is mixed with other subjects of study, to the distress and embarrassment of the everyday teacher.

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* *Outline of Elementary Geography.* By F. F. Murdock, State Normal School, Bridgewater, Mass. Revised edition. July, 1895. pp. 159.