CURRENT NOTES ON PHYSIOGRAPHY.

THE ILLINOIS GLACIAL LOBE.

THE elaborate monograph by Leverett on 'The Illinois Glacial Lobe' (Monogr. XXXVIII., U. S. Geol. Surv., 1899, xxi + 817 p., 18 maps, 6 pl. 9 figs.) has, apart from its high worth as the most detailed study of its kind yet published, a great value to the physiographer in warranting a generic treatment of the class of forms that it describes. It is not merely that one may find, in this or that part of Illinois, till plains, moraines, loess beds, gravel trains and the like, but that these several parts have a form and distribution characteristic of their class. Since Chamberlin's recognition of the lobate margin of the glacial sheet indicated by the peculiar arrangement of its terminal moraines, evidence in great variety and quantity has been discovered to confirm his generalization; and we have now come to possess good ground for regarding the moraines and the associated deposits and erosion forms of lobate ice sheets as characteristic elements of our topography, on a large scale horizontally, although of small vertical relief. The type form is relatively simple; it consists of many parts, but they are systematically and genetically related in a highly specialized unit; a unit whose empirical description is as baffling as would be the mention of an oak tree in terms of its items in arbitrary order instead of by its generic or specific name, but whose explanatory description is as easily apprehended as is that of a mature river-and-valley system. The association of several units by repetition of process provides something of the variety of nature; special features due to local conditions require an elastic instead of a rigid conception of the type; and the detection of the changes suffered by the initial forms with the passage of time affords a pleasing exercise for observation and understanding. An abstract of the facts thus understood, with Illinois as the field of their typical occurrence, should enter the high schools of this generation. Room may possibly be provided for them (by the exclusion of less worthy matter) in the grammar schools of the next generation. A closer study of the facts affords good exercise for collegiate students who have previously learned an outline of them in school. The details yet to be discovered in the field will tax the patience and ingenuity of the investigator for years to come. The monograph is a worthy monument to the skill of the observer who executed it, to the insight of the leader who planned it, and to the broad policy of the organization that supported its preparation and publication.

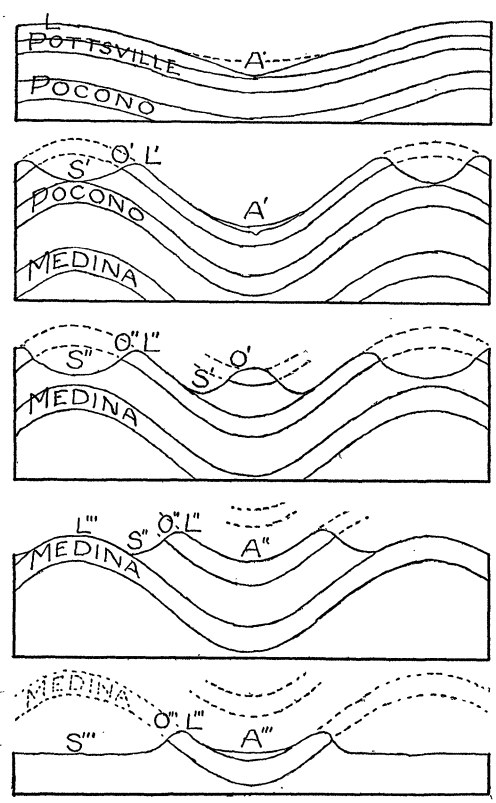
THE ALBAN MOUNTAINS.

THE group of extinct volcanoes southeast of Rome, sometimes known as the Alban mountains among English writers, but called *Vulcano Laziale* by the Italians, is elaborately described by Sabatini (Mem. descr. Carta geol. ital. X, I Vulcani del l'Italia centrale e i loro prodotti. Parte I., Vulcano Laziale. Roma, 1900, pp. xv + 392, 9 pl., 2 maps). The mountain group is the complex product of successive constructive and destructive actions. A large volcano of about 20 kil. diameter lost its upper portion and then remained as a horseshoe mountain (caldera) now somewhat dissected and open to the southwest. Its central floor had an altitude of 400 or 500 met., and its rim, of 600 to 800 met. This structure is called *Cratere Tuscolano*. A second volcano, called Monte Albano or Laziale, was built on the same axis as the first; its basal diameter being 4.5 or 5 kil., and its altitude 956 met. It has a crater 200 met. deep, open to the northwest. At a still later time, three more or less complex basins or calderas were formed on the south and southwest of the central axis; they now contain lakes Nemi and Albano, of which some admirable views are given, and the plain of Ariccia. Lavas seem to constitute only a small portion of the volcanic mass. Its chief constituent is tufa, which Sabatini explains as successive deposits of volcanic ashes washed by rains, disregarding their suggested origin in torrents of mud ejected from the craters. Engulfment is not accepted as a satisfactory explanation either of the great *Cratere Tuscolano* or of the lake basins, but the argument for the exclusion of this process does not seem demonstrative. The volume of ejected materials is estimated to be about 200 cubic kilometers. More than half of the memoir is given to local and petrographic details. A bibliography occupies 22 pages. The colored geo-

logical map might well serve as a guide to the observant traveler in this most picturesque district.

REVERSION IN RIVER DEVELOPMENT.

IN the Seven-mountain district of Pennsylvania, the anticlines and synclines of the corrugated Medina sandstone, pitching gently eastward, form an extraordinary series of zigzag ridges. Streams rise in the apex of the synclinical reentrants and flow eastward with the pitch of each synclinical axis toward the Susquehanna; and these axial streams receive branches that descend the dip-slope of the linear monoclinal



ridges which diverge from each synclinal apex. Such a scheme of drainage has usually been called consequent; yet when it is remembered that the present relief has been developed by the removal of a great series of strong and weak strata it appears that the existing streams are not the persistent successors of the original consequents, but that they have reverted to ancestral conditions after having passed through a systematic series of metamorphoses, as indicated in the accompanying diagrams. The first section represents initial conditions. An original consequent stream (A') flows along the pitch of a synclinical axis of Pottsville conglomerate and is fed by lateral consequents ($L'A'$) from the slopes of the enclosing anticlines. Section 2 represents a later time when longitudinal subsequents have been developed along the anticlinal axes of the weak Mauch Chunk shales, thus shortening the laterals of the original system ($L'A'$) by favoring the growth of obsequents ($O'S'$). In section 3 the new subsequents have shifted down the dip of their determining formation, thereby developing a new lot of apparently consequent laterals ($L''S''$), and the initial trough has been reversed into a narrow synclinal ridge, crowned by a remnant of Pottsville conglomerate. The original axial consequent (A') has vanished and an anticlinal subsequent of the second order (S'') has appeared. With still further erosion, as permitted by successive uplifts, the two first-order longitudinal subsequents (S', sect. 3) coalesce by continued monoclinal shifting, and thus form a new axial stream (A'', sect. 4) with appropriate laterals ($L''A''$) in the trough of the Pocono syncline. By yet another series of analogous changes ending in the fifth section, a third-order axial stream will be developed (A''') fed by a series of third-order laterals ($L'''A'''$) on the Medina syncline, such as at present exist. Although these streams closely imitate the ancestral consequents of the first section ($A', L'A'$), it is evident that the imitation is due to reversion and not to the persistence of a fixed type. Streams of this kind might be called reversional consequents, renewed consequents, reconsequents, or simply resequents.

W. M. DAVIS.

CURRENT NOTES ON METEOROLOGY.

QUARTERLY JOURNAL OF THE ROYAL METEOROLOGICAL SOCIETY.

THE January *Quarterly Journal of the Royal Meteorological Society* contains several articles of general interest. Dr. Nils Ekholm contributes a paper 'On the Variations of the Climate of the Geological and Historical Past and their