LETTERS TO THE EDITOR.

***Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

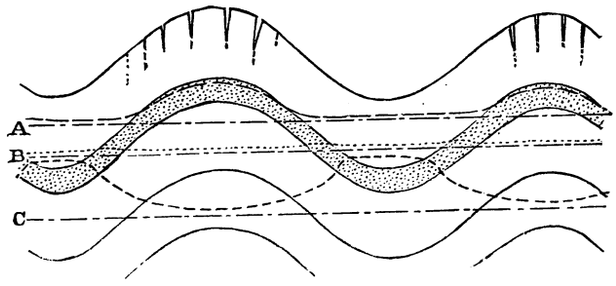
Twenty copies of the number containing his communication will be furnished free to any correspondent on request.

The editor will be glad to publish any queries consonant with the character of the journal.

Synclinal Mountains and Anticlinal Valleys.

IN the recent reading of two very different books a statement is encountered that seems incomplete, and to a certain extent misleading, regarding the origin of synclinal mountains and their accompanying anticlinal valleys. The first book is an advanced monograph, entitled 'Les Formes du Terrain,' by La Noë and Margerie, in which it is stated (p. 150) that "finally a very remarkable consequence of erosion in regions of folded structure is to give rise to an ultimate arrangement of relief in which the original depressions are replaced by elevations, and *vice versa*." This generalization seems too broad. In the first place, the only ultimate form of land-sculpture is the base-level plain, down to which every surface must be reduced, whatever its structure, if time be allowed. Of this the authors are undoubtedly aware, and their term 'finale' should perhaps be rendered 'late' rather than 'ultimate.' But, in the second place, it is by no means essential that late forms developed by erosion on folded structures should present the inversion referred to. It is not a necessary or even a general result of progressive denudation, but simply a special result of a certain relative position of hard beds and the controlling base-level. For example: let the dotted stratum in the accompanying figure be a hard sandstone, while the other beds are soft shales and limestones. If the base-level be at *A*, a little below the arches of the hard bed but above its troughs, a late form assumed in the progress of denuation will be broad synclinal lowlands between anticlinal ridges (shown in long-broken lines, —— —— ——). In this case the late form corresponds to the original structural surface. But if the base-level is at *C*, the opportunity for quick erosion that is afforded on the lower soft beds, when they are discovered by the breaching of the anticlinal crests, will soon cause the chief water-courses to abandon the synclinal axes that they had before followed, and excavate their valleys along the anticlinal axes. In this case the late form (shown by short-broken lines, — — — —) consists of synclinal ridges or mountains, and there has been an inversion from the original structural surface. It may be added that this result is favored if the region is first base-levelled at an altitude like *B* (the ultimate form in this cycle of development being shown in the dotted line . . . .), and then bodily elevated so that the base-level falls to *C*; and this, I think (following suggestions from Gilbert and McGee), has been the case with the Appalachians.

The second book referred to is Hinman's 'Eclectic Physical Geography,' recently published. The Jura Mountains are taken as examples of young forms, in which the anticlinals are ridges: the Appalachians are chosen as examples of old forms, in which many anticlinals are worn down to valleys. By the time the Jura "have suffered erosion as long as the Appalachians, the present position of the mountains and valleys will have been reversed" (p. 261). It



seems pretty certain that when the Jura have suffered erosion as long as the Appalachians, they will be worn down flat; and whether an inversion of ridges and valleys will take place, or not, during this erosion, is entirely a special result of the relative attitude of hard beds and base-level, as above illustrated, and by no means open to unqualified prediction on general principles.

From finding the above statements concerning the origin of synclinal mountains in two books whose objects are so dissimilar, I have inferred that they represent a general belief, in which a special case is conceived to be a general one: hence this brief note on the subject. The question is a small one, and unnecessary in general accounts of geographic forms; but when the progress of denudation is alluded to, and early and late forms are distinguished, it is essential that the principles of classification should be clearly stated, if one would gain a full understanding of the systematic development of the surface of the earth. W. M. DAVIS.

Philadelphia, Penn., Dec. 12.

Publications received at Editor's Office, Dec. 3–15.

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