CORRESPONDENCE.

MECHANISM OF EARTH MOVEMENTS.

SIR,—May I be allowed to thank Mr. MacGillavray for reading my paper carefully? In reply to his letter (GEOLOGICAL MAGAZINE, March, 1934) all his criticisms are levelled at the possibility of a crust oscillation, and I need hardly say that when this idea first presented itself I was quite as astonished as Mr. MacGillavray. I did not use the undeserved term "theory", but considered that the fittest thing was to describe shortly step by step the direction in which several years' work had led—leaving out, of course, all the blind alleys explored. For this reason the paper was entitled "A Search for, etc." and my hope was that someone would come forward and help me to look for the fire behind all this smoke. Any discussion or criticism is welcome which will help to clear up the matter.

"Whether . . . the equality of terrace intervals between different sites" really exists cannot, I think, be questioned, for it formed the basis of the eustatic hypothesis associated with Depéret's name.

(1) This is so; I could make nothing of these steps and presumed that independent fluctuations of lake-level had masked the effect of earth-movements, if any.

(2) I was referring to deficiencies above the axis, and admit I should have said so: the question of impulses from below was being held strongly in mind, so that only the relationship of the movements on one side seemed important. The figure of 1·79 was not selected at random: it is the square of 1·34, which is the ratio given by 247/330, and the dotted curve was extended backwards over the larger movements to see if any relationship would emerge. The only arbitrary feature about Fig. 5 is the axis, and my critic's *reductio ad absurdum* leaves me unmoved, because taken separately many of these points can be torn to pieces, but together they begin, as the Chinese say, to "cast a shadow".

(3) The Old Wolvercote Channel would have been cut more deeply only if all the erosion occurred at the same place. One phenomenon of river action is the abandonment of one channel and the cutting of another. Also I should not be so bold as Mr. MacGillavray and assume the same amount of water to run throughout various ages. Fig. 8 is only intended to be qualitative and not quantitative as Fig. 10; moreover, if the two are to be compared, the first trough in the latter, and not the buried channel, is to be correlated with the Summertown-Radley channel.

(4) I do not follow Mr. MacGillavray here. My argument is (p. 507) that both styles of curve result from the same original crust action proceeding from below, but that the Bilbao type shows a falling-off from the Nive type, which is the more common.

(5) It is misquoting to say I speak of a *rising* of the coast here. The rise preceded the movements in Table 2 and the last column shows the irregular subsidence. Fig. 15 is an attempt at the difficult task of illustrating the suspected movements: it is drawn to show sea-level rising and falling because the beaches are disposed in that manner, but the curve must be inverted for the land movements—

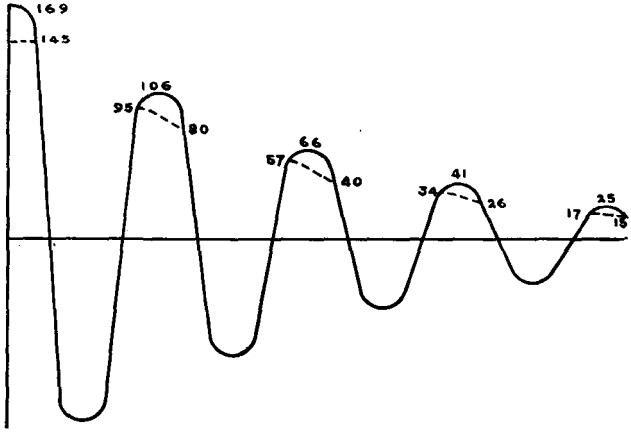

FIG. 15.

Spain in full and France, where it varies, in dotted lines. In another manner, the difference in behaviour can be appreciated if a soft rubber ball is placed on a table and one's hands held thumb to thumb palm downwards at some distance above it, the left to represent Spain, say, and the right France. Both hands are brought down together, the left on to the table and the right on to the ball which first gives way to a certain extent and then—if allowed—raises that hand a small amount; cf. p. 516, "as if a substratum had an elastic quality."

(6) Suggestions are welcome, but after examining Fig. 4 and Table 1 I do not think the first suggestion will be widely received.

R. G. LEWIS.

PETROLOGY AND THE WESTERN RIFT OF CENTRAL AFRICA.

SIR,—In the article by A. W. Groves in the GEOLOGICAL MAGAZINE for November, 1932, a very careful and satisfactory petrological account of certain features of the old rocks of Uganda in the vicinity of the Western Rift is given, about which there will probably be little difference of opinion. The interpretation of these characters in relation to Rift movements appears, however, to be far less *satisfactory and by no means convincing.*

One would readily agree with Dr. Groves in his observations on