white limestone is the last formation one should imagine to have been deposited among the peaks and valleys of a submerged land mass; completely missing out in this area the yellow limestone and other underlying beds which elsewhere are present all over Jamaica. I have never seen pebbles of the granodiorite in the undoubted Blue Mountain conglomerate and in my opinion it is impossible definitely to identify the source of origin of any of the pebbles in that bed. Being, to put it euphemistically, an indifferent petrologist, and not caring very much for joint papers, I preferred to leave out the petrology of the rocks; but I am informed that they do not show any extraordinary features.

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RIFT VALLEY IMPRESSIONS.

SIR,—Dr. Shand's paper, published in the GEOLOGICAL MAGAZINE for July, entitled "Rift Valley Impressions", is bound to stimulate the differences of opinion which exist as to the origin of those greatly discussed features, the African Troughs. The Professor is but one of many; he is not the only investigator to desert exaggeration and plot sections across the Rifts to true scale and thereby to discover how insignificant these mighty rents become, or to comfort himself, if so he did, with the reflection that any of the earth's great features would be equally reduced to truer though less spectacular proportions if similarly treated. This, by the way. The interest of the African Troughs lies in their length and disposition, not their depth.

Speaking for myself, the Eastern Valley is not particularly impressive when seen from the air between Kisumu and Nairobi, and I am aware how comparatively insignificant it may appear when entered, say, from Rumuruti on a journey to Nakuru.

Lake Tanganyika, as seen between Kigoma and Kipili, is not at all diagrammatic when judged by the usual Rift standards. On the other hand, the outlook over the Rukwa Trough from the western edge near Sumbawanga is as astonishing as the view over the sunk-land of the Coastal Belt of British Somaliland seen from the edge of the escarpment east of Sheikh, part of course, of the same great system of faults. "Astonishing" is, on the whole, too weak a word. Even so, whether in Tanganyika Territory or in Somaliland the effects of erosion are sufficiently conspicuous. The structure of the Magadi section of the Eastern Rift, the succession of step-faults on the eastern side, the great Nguruman scarp on the west, seen not necessarily from the railway, but from an advantageous point near Turoka, is very impressive at dawn or dusk. The same is true of the northern end of Lake Natron. Many of the faults are relatively new. The fact that this "freshness" of the scarps is a function of varying age must be clear to anyone

who has wandered in and out of the Rifts. Professor Shand's remark (*Proc. Geol. Soc.*, No. 1313, 4th June, 1936) that, "rift faulting was the consequence, not the cause of the regional volcanism" is in my opinion certainly true in the case of the Magadi section. The ten months or so I spent in the district were scarcely required to convince me of it: very little imagination is needed almost to see the blocks of lava sagging, like tombstones covering unconsidered graves as support was withdrawn. One cannot escape the conviction that the extravasation of the surrounding lavas was a cause, if only a subsidiary one, of the sinking. The case, however, appears different when other places are considered, such as Lake Tanganyika, where there are no lavas, although the bottom of the trough is very deep, 1,664 feet below sea-level.

When the enormous length of the Rifts is taken into account, together with the associated faults, surely no doubt can exist that some cause has been operative more fundamental in importance than local vulcanism, in other words, the manifestations of igneous activity are results and not causes, though minor local exceptions occur. I have believed for long in the ancient fault system upon which Professor Shand would seem to rely, but its existence merely pushes the answer to the perplexing "Why?" back into the obscurity of time.

Without professing to understand the origin of the present system of faults, the following facts for many years appeared to me to have a bearing on this subject.

(1) The existence of Lake Victoria in the centre of an almond-shaped horst outlined by the Central and Eastern Troughs, and associated faults.

(2) The concentration of great granite masses in the south and central portions of the horst, and

(3) The dominant and remarkable east and west trend of the foliation of the granite and rocks of the Upper Basement Complex south of the Lake and the general parallelism of the foliation elsewhere to the sides of the Victorian horst.

The size of the granite bathylith "G 3" is enormous and when allowance is made for reduction by erosion, its influence, first as a plastic and then a resistant body, on the history of Central Africa must have been very great. Contraction and especially partial relapse into the reservoir during cooling of a mass so gigantic would set up stresses and thereby produce lines of weakness around or in the vicinity of its edge, conceptions which later gave birth to that ancient system of faults which undoubtedly exists, though now so largely covered by later beds, or eroded out of recognition. And if a contributory cause is (and no doubt it is) necessary, why not the higher rate of rotation of the Earth in those far-off days?

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