

have these involved with the Laurentian gneiss, just as the hornblende schists and mica schists are, and intercalations would be produced which would, as in the case of the schists, frequently simulate interbedding of quartzite or limestone, as the case might be, with the gneiss. The deception would, of course, be intensified by subsequent further deformation of the crust by pressure so as to be practically beyond detection, if the clue were not followed up from a starting point where such subsequent dynamic agencies have not obscured the true relationship. This, the writer is persuaded, is the explanation of many of the intimate associations of gneiss and quartzite or limestone, whereby rocks really metamorphic sediments are so involved and welded with rocks of plutonic irruptive origin that they have been taken together as a simple sequence of deposited strata.

In some portions of the Laurentian country, which the attitude of the flanking rocks indicates was once arched over by an anticlinal dome of the latter, there are found patches of schist lying quite flat, or nearly so, upon the granite, showing, in favorable cliff sections, a brecciated or intrusive contact on the under side. These remnants seem to show that the anticlinal dome was flat or very lowly rounded, and that only on the flanks of the Laurentian boss did the strata composing the arch plunge down at high angles.

*Significance of Relationship.*—Bearing in mind the essential distinctions which exist between the rock formations of the Ontarian and Laurentian systems, both as to their lithological character and their mode of occurrence, and remembering also their relative geographical distribution, the foregoing statement of the relationship which obtains between the two systems leads clearly and unavoidably to this conclusion, viz., that the formations of the Ontarian system at one time rested, as a volume of hard rocks, upon a magma which subsequently crystallized as the Laurentian granite-gneiss; so that the present line of demarkation between the two systems must be regarded as representing the trace of what was once a plane of contact between the then crust and the magma upon which it floated.

This conclusion affords us a conception of the Archean which is ideal in its simplicity and which gives us the key to the unraveling of the mystery in which the subject has been involved. The fact that the crust, which constitutes what we now call the Ontarian system, was crumpled while it floated on the magma; the fact that its lower portions were shattered by disturbance so that the magma penetrated the fissures and enclosed detached fragments; the fact that there were currents in the magma which arranged the inclusions in streams and also produced the foliation of the gneiss; the fact of contact metamorphism—all these are incidental and concomitant circumstances of the great essential condition of a crust resting on a magma.

But from the nature of the rocks of the Ontarian system it is clear that