## IS THE KILLARNEY GRANITE DIFFERENT IN AGE FROM THE ALGOMAN?

IN a recent address[1] entitled "Certain Aspects of Geologic Classifications and Correlations" Professor Rollin T. Chamberlin makes two statements in his discussion of pre-Cambrian correlations, which interest me as a rather sweeping expression of a theory which is important if true, but which is contradicted by some easily observable facts. He says: "For a given province, such as the southern margin of the Canadian Shield, or at least important portions of it, the granite method of classifying rock systems is theoretically sound. In this particular province the three granites of widely different ages, the Laurentian, Algoman and Killarney, are practically and potentially of great assistance in unravelling and delimiting the pre-Cambrian systems." Again: "From geologic evidence, the Laurentian, Algoman and Killarney granites appear to be so different in age that radioactive age determinations should distinguish between them."

The important matter in these statements is the recognition without question or doubt of the Killarney granite as distinct from the Algoman. The proponents of this view regard the Killarney granite as of Keweenawan or post-Keweenawan age. Counter to this belief are the facts that a herd of olivine diabase dykes, presumably Keweenawan in age, cut the Killarney granite, and that north of Sault Ste. Marie the lavas of the Keweenawan were poured out on the deeply eroded surface of the Killarney granite. In view of these facts, set forth in my paper on "Some Huronian Problems,"[2] it is somewhat surprising to see in textbooks and authoritative reviews like Chamberlin's dogmatic statements of the distinction between the Killarney and Algoman granite. In so far as I have been able to discover in the field and in the literature of the subject the Killarney granite is the Algoman granite; and it would be of interest if the "geologic evidence" as to their difference in age to which Professor Chamberlin refers might be set forth so that, if necessary, it might be checked up in the field.

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## GINKGO

RECENT news reports of monoecious growth in a century-old Ginkgo near Philadelphia can not be trusted direct. Could such a phenomenon result from injury instead of earlier unknown grafting? Possibly the most extraordinary anomaly in Ginkgo is a growth of microsporangia directly on the foliage leaves, "usually near their bases." This appears to be a true recessiveness, recalling an older seed fern condition, precedent even to the Cordaites. But evidence bearing on the morphologic as well as physiologic nature of sex in the seed plants is much wanted, and discussion must long fall short of final analysis. We must long search and search through the rocks and the forests before the origin of the conifers and their relationship to the Cordaites and flowering cycads can be better discerned.

In a few weeks (early May) the Ginkgo tree will blossom. For any fruit of a seed plant—dicot, monocot or gymnosperm—begins as a "blossom" or in an absolute sense a "flower." Though not alone in common usage but by definition a "flowering plant" means a higher seed plant which has advanced far toward a relative specialization of stem and foliar structure and which may bear round its fertile organs an inclosing husk of large and beautiful vari-colored cataphylls, soon wilting away or sometimes fusing into the mature fruit. Essentially, however, the flower is an axial prolongation beyond the series of modified protecting foliar organs consisting in a subtending cyclic or spirally set series of microsporophylls or stamens, as followed by a terminal megasporophyll or series of such, but with the seeds always inclosed—the angiospermous condition. Since, however, these seeds are inclosed within the megasporophylls which may bear many seeds or but one, and may be single or numerous and either cyclic or spirally set, flowers so readily assume an infinite variety of form, size and color. The much modified foliar structures characteristically bear the nectaries haunted by insect and bird. Where flowers are *unisexual* the implication is that they were once *bisexual*—in fairly recent geologic time, "complete," "perfect," *hermaphrodite*. While in the foliar fusion about the ovule and fruit there is seen a late reflex of the far simpler course of growth and fusion which at least as far back as Devonian times resulted in the large seeds of Pteridosperms and Cordaites, often with heavy bundle-supplied integuments. In this sense there is a fundamental analogy between seed and flower.

Nevertheless, by some strange ratiocination the simpler forms of sex-perfect flowers seem to have been long regarded by geologists as being little older than Cretaceous time. And this deception long found its way into botany, despite the presence of the vestigial flowers of Gnetaleans, and obvious reasons for the failure of a fossil floral record in the Permian and older Mesozoic rocks. Could the evidence in view be taken so superficially, accepted so directly? As apposed to the ordinary or higher types of flowers, the "cones" of the conifers differ mainly in a uniform unisexuality, with much fusion of parts and a high

[1] SCIENCE, February 22 and March 1, 1935.
[2] *Bull.* G. S. A., Vol. 40, pp. 361–384, 1929.