A WIDE-SPREAD ERROR RELATING TO THE PYTHAGOREANS

THE "Pythagorean symbol" is defined in some of our dictionaries as the hexagram. This is done, in particular, in Webster's "New International Dictionary," second edition, 1935, under the entry "hexagram," as well as in the "Century Dictionary," 1906. On the contrary, recent writers on the history of Greek mathematics, including M. Cantor and T. L. Heath, call attention to the fact that the star-pentagon is said to have been used by the Pythagoreans as a symbol of recognition between members of the same school and to have been called by them Health, according to Lucian and the scholiast to the *Clouds* of Aristophanes; *cf.* "Manual of Greek Mathematics," by T. L. Heath, 1931, page 108. According to Murray's "English Dictionary," under the entry "Pythagorean," 1909, the capital Greek letter upsilon was used by the Pythagoreans as a symbol of the two divergent paths of virtue and of vice.

The construction of the regular pentagon is related to what is now commonly called the "golden section," *viz.*, the division of a straight line segment into extreme and mean ratio. Therefore, it is of great historical interest to know whether the early Pythagoreans were familiar with this section. The construction of the regular hexagon, on the other hand, is very much simpler and does not involve the solution of a quadratic equation. Hence the assertion that the Pythagorean symbol is the hexagram instead of the pentagram is not only misleading but it also fails to exhibit the mathematical advancement of the Greeks at about the time of Pythagoras. It is natural to assume that the symbol of recognition among the Pythagoreans was selected because it involves something that was then regarded as somewhat abstruse rather than something that was even then regarded as elementary.

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MORE THAN TWO PRE-CAMBRIAN GRANITES IN THE CANADIAN SHIELD

IN the May 24, 1935, issue of SCIENCE Professor Andrew C. Lawson has objected to a statement of mine that "from geologic evidence, the Laurentian, Algoman and Killarney granites appear to be so different in age that radioactive age determinations should distinguish between them."[1] This statement of the distinction between the Algoman and Killarney granites and statements of like import in most of the text-books on historical geology which have appeared in the last dozen years are characterized as dogmatic, and Professor Lawson calls upon me to set forth the geologic evidence that these granites are of different age. Professor Lawson's view is that "the Killarney granite is the Algoman granite."

The point urged in the address under criticism was that the methods of determining the age of igneous rocks by radioactive disintegration are now apparently becoming sufficiently accurate to raise hopes of differentiating the granites of the Canadian Shield on a time basis and of obtaining a few reliable dates in the pre-Cambrian time scale between which may be fitted in the various geologic events and rock formations. There seem to be enough different granites to make this possible. Investigations along the lines advocated should give us the facts of the case, whatever they may prove to be, and Dr. Lawson's view that the Algoman and Killarney granites are of the same age would be put to the test and its correctness or incorrectness presumably determined. The spirit of the address to bring to bear new evidence of seemingly great value in discrimination to check current views of correlation seems to me not one of dogmatism, but the reverse of it. It calls attention to an additional method of appraisal.

Belief was expressed in the existence of three granites of widely different age in the Canadian Shield. For convenience the three familiar names, Laurentian, Algoman and Killarney, were used. One should not be the slave of these names, however, in considering the main problem. Dr. Lawson asks for geologic evidence. Some of this evidence may be listed as follows.

I. Granitic rocks older than the Timiskaming system have been reported by many observers as the result of studies covering a period of many years. To be sure, most of the granite originally called Laurentian is now thought to be of later date, but the later studies by no means eliminate the Laurentian granites as a whole. Pebbles of a granite older than the Timiskaming are found as important constituents of the conglomerates in the lower part of the Timiskaming series.[2]

II. Important granitic intrusions cut through the Timiskaming succession in large volume without penetrating the overlying Cobalt system of strata, which is separated from the Timiskaming by a great unconformity. These masses of granite were intruded, therefore, after deposition of the older Timiskaming and before deposition of the younger Cobalt formations, for whose basal conglomerates they have furnished numerous pebbles.[3]

III. In certain other areas there is granite which is younger than the Cobalt. For this I will quote Dr. Lawson himself, who comments on a report on the

[1] SCIENCE, February 22, 1935, p. 186.

[2] H. C. Cooke, W. F. James and J. B. Mawdsley, Geol. Surv. of Canada, Mem. 166 (1931), p. 56 and pp. 104–106.

[3] Geol. Surv. Canada, Mem. 166, pp. 108–138.