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GEOMETRY AND PHYSICS[1]

TWENTY years ago the abstract point of view in geometry was becoming a familiar one to mathematicians. The essential element in the movement of thought at that time seemed to be the freeing of geometry from all reference to physical reality. Geometry as studied by mathematicians must be a set of propositions arranged in a sequence of logical deduction, proceeding from a set of unproved propositions (the axioms, or postulates) which are stated in terms of undefined elements. If the undefined elements are points and lines, for instance, the mathematician does not inquire what is a point or line. All he cares to know about them is stated explicitly in the axioms.

This point of view made it possible for the first time in history to see geometry as a clear-cut whole. It was definitely separated from philosophy on the one side and from other branches of physics and mathematics on the other. The result was a great gain for clearness of thought in all these fields, a gain which has not been accompanied by any loss of mutual contact or support.

During the following years mathematicians have continued to develop the postulational or logistic method, so that by now it has demonstrated its value as a practical scheme of arrangement and exposition in the most diverse branches of mathematics. While doing this it has, of course, lost in freshness what it has gained in respectability. But during the same period a series of brilliant discoveries in physics has been making the abstract point of view a vital issue in that science also.

If we examine the classical branches of physics we shall find that the main elements of the abstract point of view have been im-

[1] Address as retiring vice-president and chairman of Section A—Mathematics, American Association for the Advancement of Science, Boston, December, 1922.