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The New Mathematics

A listing of curriculum studies in mathematics of this decade, which have attracted national attention, would involve no less than a dozen entries. Considerable information is already available on the work of the Commission on Mathematics of the College Entrance Examination Board, the Committee on the Undergraduate Program of the Mathematical Association of America, and the University of Illinois Committee on School Mathematics. Among the others, more information will be available soon on the work at Ball State Teachers College and the University of Maryland.

In the summer of 1958 the School Mathematics Study Group (MSG) received its initial support from the National Science Foundation. Directed by E. G. Begle, recently secretary of the American Mathematical Society, MSG started its activities at Yale University with a writing group of 40 persons made up of top-level research mathematicians and secondary-school teachers. MSG is in an excellent position to make use of what has been learned in the earlier studies and thus to resolve some of the concern about different points of view within the mathematical community. Although during this year MSG will concentrate primarily on grades 7 through 12, this broadly conceived national study provides for a more extended view of mathematics education at all levels of instruction than has been possible in any of the other studies. Its plan to involve college and university mathematicians in all parts of the country working in their own regions as well as on national teams should enable MSG to have the cooperation of many mathematicians and their colleagues in other sciences.

Mathematics plays a special role in a society which is changing at an accelerating pace. For this reason the task of revising the school programs in mathematics is extremely urgent and requires a massive effort on the part of mathematicians, teachers, and school administrators. Since it is impossible to predict what a child will need to know in his adult life, and since the nature of his vocation can be expected to change with increasing frequency, the main emphasis in education must be placed on methods of obtaining knowledge, rather than upon fixed bodies of information. The deductive method—and mathematics is the science of deductive reasoning—is one of the principal tools for obtaining knowledge. A person needs to understand mathematical methods and language in order to use the accumulated knowledge and newly discovered results of the physical, biological, and social sciences and to apply them to engineering, or medicine, or the making of social policies.

The mathematicians believe, with justification, that mathematics is worth studying for its own sake. But modernization of the mathematics curriculum not only benefits mathematics, it also benefits science. To quote Courant: "The regained internal strength and, above all, the enormous simplification attained on the basis of clearer comprehension make it possible today to master the mathematical theory without losing sight of applications." In their search for better ways of leading students to an understanding of mathematics, enjoyment in their study, and greater achievement in school, mathematicians serve science well indeed.

Cooperation of mathematicians with engineers and social scientists has already led to the preparation of recommendations on college mathematics courses, issued by the American Society of Engineering Education and the Social Science Research Council. AAAS conferences on mathematics instruction, held in 1956-57, brought together some 300 mathematicians, scientists in the other fields, and teachers representing all levels of instruction to consider and advise on the curriculum studies. Perhaps another conference of this kind would be desirable. Also through MSG there are now ways of promoting this cooperation so important for science education.

There is just cause for optimism among scientists because of the great effort now being made to improve mathematics education.—J.R.M.