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Emphasis on Mathematics

If college teachers of science could select the area of science in which they would most like to have their entering students show proficiency, mathematics would undoubtedly be first choice. No other discipline—except language itself—is so fundamental to all of science and of such widespread usefulness to scientist and nonscientist alike.

Despite the importance of mathematics, instruction is suffering from several ailments. Much of the curriculum, from arithmetic to the calculus or beyond, is out of date. The typical youngster is introduced to arithmetic by a teacher with little knowledge of, or interest in, this subject. At the high-school level there is a shortage of well-qualified teachers, and there has been a declining emphasis on rigorous mathematical work. College time is being devoted to remedial courses in algebra and geometry, and sometimes even in arithmetic. As a result of these ailments, some students learn little and others learn things of little use. The fifth-grader still has to learn that there are 320 rods in a mile. Despite the everyday usefulness of concepts of probability, few students get far enough to be introduced to this subject. Social science majors find much of the traditional material irrelevant. Even the mathematics major has to wait a long time before he gets into modern mathematics. Throughout the school years, mathematics ranks low in popularity, but former students of all levels rank it high when asked: In which subjects do you wish you had had more work?

Mathematicians are attempting to improve the situation, but their efforts are not enough. The problem is broad enough to make it a general scientific and educational responsibility. Perhaps we should dramatize the general importance of mathematics and bring pressure on the schools to give better instruction to more students.

Higher college entrance requirements in mathematics—or in English or other subjects basic to good preparation for college work—will put pressure on high schools to improve their instruction. Pressure from above is not the only, or even the most desirable, method of improving high-school programs. But pressure from colleges is a wholly legitimate method of strengthening the education of the growing fraction of high-school students who are planning to enter college.

I. I. Rabi recently suggested a more ingenious method of emphasizing mathematics. Rabi proposed to the Joint Congressional Committee on Atomic Energy that winners of federal scholarships be selected by an examination in mathematics; any high-school graduate who passed with satisfactory marks an examination over a 4-year program of mathematics would be entitled to a college scholarship for his freshman year, and any freshman who passed an examination in the calculus (or higher course if the calculus was taken in high school) would have his fellowship renewed.

The details have not been worked out, but the purpose is clear: to emphasize the importance of acquiring a good mathematical foundation. Students given these scholarships would be free to choose whatever fields of specialization each preferred, for the purpose would be to insure that a larger number of students secured the mathematical foundation that would be valuable whether they chose to become scientists, economists, engineers, or businessmen.

Whether or not these suggestions represent the best means of accomplishing this end, it is time to put very special emphasis on the importance of mathematics.—D. W.