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Who Teaches Science?

The AAAS Cooperative Committee on the Teaching of Science and Mathematics—a committee consisting of representatives of scientific societies and societies interested in the teaching of science and mathematics—in 1960 published its recommendations for the preparation of high school science and mathematics teachers [*Science* **131**, 1024 (1960)]. The timing was excellent, for the recommendations served as a basic document at several subsequent conferences on the education of teachers and laid much of the groundwork for a study carried out by the National Association of State Directors of Teacher Education and Certification. The association with the long name—NASDTEC for short—consists of the persons, usually one per state, responsible for certifying public school teachers in their states. Their report follows that of the Cooperative Committee in placing much emphasis upon better education in the disciplines to be taught. The full impact of this recent report is yet to come, but already its recommendations for the education of teachers have been adopted by 110 colleges and universities and by four states. Adoption in others is expected, for the report has been formally endorsed by appropriate educational groups or agencies in 15 of the 50 states.

But there is a substantial gap between what is desirable and what is. NASDTEC, again in cooperation with the AAAS, has made clear the size of this gap through a second study which analyzes the education of a statistically good sample of all teachers of science and mathematics in the public and private high schools of the nation. (The full report will be published by the National Science Foundation.) The most striking finding is the contrast between the general educational level of these teachers and their education in the specific fields taught. Essentially all have bachelor's degrees, and 39 percent have master's degrees. But the amount of work in the subjects taught is disproportionately small. The data are best expressed in terms of classes rather than teachers, for some teachers (often those with least preparation) have only one or two classes, while others have five or six. Here are the findings:

	Percentage of classes taught by teachers whose total hours of college credit in the subject taught is—			
Classes	*Fewer than 9*	*9–17*	*18–29*	*30 or more*
Biology	8	13	22	57
Chemistry	14	20	32	34
Physics	23	43	20	14
Mathematics (grades 9–12)	11	12	32	45
Mathematics (grades 7–8)	34	19	26	21

An individual teacher with 30 hours in his field is not necessarily better than another individual with only 10. But, in general, 30 hours is surely better preparation than 10. Yet only in biology does a student have better than a 50–50 chance of being taught by a teacher who has had 30 hours of college work in the science being taught.

This latter study provides the most detailed information yet available on the subject-matter preparation of America's high school science and mathematics teachers. The earlier study means that many scientists and the responsible educational authorities have agreed upon desirable amounts of subject-matter education for future teachers. Together, the studies provide the basis for action, action that has already started in some states. We salute NASDTEC for wanting to carry out these studies. We are glad that AAAS was able to help—D.W.