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Standards for Science Teachers

A useful and satisfying chapter in the history of the Association ends this month with completion of the studies of the qualifications of science and mathematics teachers that AAAS has carried out jointly with the National Association of State Directors of Teacher Education and Certification. One study analyzed the characteristics and education of secondary school teachers of science and mathematics [*Science* **140**, 880 (1963)]. Another, to be published soon, recommends standards for the education in science and mathematics of prospective elementary school teachers.

The other study is the one that started collaboration between the two associations. Several years ago, the National Association of State Directors of Teacher Education and Certification became concerned about the inadequate subject-matter preparation of the new teachers they are called upon to certify, especially high school teachers of science and mathematics. With support from the Carnegie Corporation of New York and with a good start provided by the AAAS Cooperative Committee on the Teaching of Science and Mathematics [*Science* **131**, 1024 (1960)], the two associations collaborated in an extensive series of discussions, conferences, and sometimes compromises that resulted, in September of 1961, in the publication of a set of guidelines for the education of secondary school teachers of mathematics and science.

These guidelines recommend that a prospective science or mathematics teacher earn an undergraduate major in the field in which he plans to teach, that his program emphasize those areas of the discipline that are taught in high school, and that the undergraduate work be adequate in quality and quantity to permit him later to pursue honest graduate work in his field. The guidelines also recommend that a fifth year of college or university work, which increasingly is required of teachers, emphasize courses in the subject to be taught.

These guidelines have been adopted, wholly or in substantial part, by Arizona, Arkansas, Georgia, Indiana, Kansas, Louisiana, Mississippi, New Mexico, North Carolina, Oregon, Pennsylvania, Puerto Rico, Utah, and West Virginia, and have been "approved," without being "adopted," by Alabama, Colorado, Connecticut, Illinois, Maryland, Massachusetts, Montana, Nevada, New York, Oklahoma, Rhode Island, and Vermont. Action is pending in a number of other states; at least 170 colleges and universities have adopted the guidelines as standards for their own programs; and North Carolina used them as a basis for new standards in fields other than science and mathematics.

Here, then, is a fine and useful start in the direction of better educated teachers. There is, of course, a long way to go, and for some time to come there will be real justification for criticism of inadequacies of teacher education. At the same time, the fact that half of the states have so quickly adopted or approved the higher standards set forth in the new guidelines promises substantial improvement in the subject-matter qualifications of high school science and mathematics teachers. Scientists will no doubt approve this trend wholeheartedly. As they do, they can give credit to an educational organization for being a prime mover in bringing about this change.—D.W.