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The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects are to further the work of scientists, to facilitate cooperation among them, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.

## Effective Use of Scientific Advice

The federal government is aware of the value of availing itself of the best possible counsel in scientific matters, and most scientists will accept appointments on Washington committees. Unfortunately, most such committees function ineffectively. In part, this is because they are appointed for inappropriate tasks or for inadequately delineated objectives. Thus committees may be asked to ponder the imponderable or to make decisions that timid administrators should have the courage to make. Even when the scope of the committee's functions is proper, a poor outcome may result if the agenda and procedures are badly chosen. Moreover, if a panel produces a wise result, the product is worthless unless it reaches and is acted on by those in authority.

At least two agencies in Washington use scientific advice effectively—the National Institutes of Health and the Atomic Energy Commission. Advisory groups of these agencies have important features in common: long tenure, chairmen not affiliated with the government, preparation of reports by members rather than by the agency secretariat, and free access to agency heads.

Evaluation of the relative merits of applications for grants involving more than a billion dollars a year is made by NIH study sections, which usually consist of about 12 experts who serve for 4 years and meet three times a year for 2 or 3 days. NIH personnel perform executive secretarial service, but the chairmen are outside scientists. Two members look deeply into each application and present their views to the full committee. After discussion, a vote is taken and a numerical priority is assigned by each member. The consensus of the discussion is written up by one of two members responsible for the close study and serves as a permanent record. These outputs have an important bearing on whether a grant is made. Top administrative personnel of NIH appear at the meetings. Morale is high. Members give devoted and thoughtful service and often spend extra hours on their tasks.

The General Advisory Committee of the AEC has different and broader functions, but its features are similar, and its activities have led to important advances in the field of atomic energy.

Illustrative of undesirable practices are the procedures of another large agency. This organization has successfully recruited as consultants most of the best talent in relevant fields, yet its committees have little influence on its programs. Appointments are for 1 year. The committee chairmen and secretaries are government employees. They are conscientious, but their scientific attainments and prestige do not match those of the visiting scientists. Agendas for the meetings are chosen without adequate consultation with members. Often the topics seem trivial in comparison with the topics, not discussed, that need full discussion. The minutes, if any, are fragmentary and are prepared by the secretariat and circulated long after the event. Repeatedly, key ideas are brought forth by consultants, but are lost. Urgent recommendations are made, but seem rarely to be put into effect. Either they do not appear in the minutes, they are not conveyed to those in authority, or they are otherwise neglected. The committee never sees the agency heads and cannot be sure its voice is heard.

In view of these contrasts, differences in the effectiveness and morale of the scientific advisory groups in the various agencies are not surprising. The basic features of the system used by NIH and AEC ought to be adopted by other agencies.—P.H.A.