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Selecting the Next Generation

The traditional method of selecting the next generation of scientists is highly personal: the master chooses his own apprentices, arranges some method to help finance their graduate education, tutors them for several years, and then sponsors them as they seek positions of their own. The masters are usually satisfied with this method, and can justify it by a large number of successes. But perhaps their satisfaction also reflects the common tendency to be blind to one's own errors. The statistically minded critic is always skeptical of a situation in which the same person makes a decision and then decides whether that decision was good or bad.

It is difficult to investigate the accuracy of many masters in selecting their own apprentices. But one can study the supplementary methods used in large fellowship programs such as that of the National Science Foundation. Under this program, the Office of Scientific Personnel of the National Academy of Sciences-National Research Council arranges for panels of scientists to review statements of each candidate's research plans, transcripts of his academic record, his scores on standardized examinations in his field of special interest, and statements by scientists who are acquainted with his earlier work. On the basis of this information each panel rates a number of candidates with whom the panelists are not personally acquainted.

Ordinarily, geologists select graduate students in geology, chemists select those in chemistry, and so on. But is such segregation of the candidates necessary? Could geologists do as good a job as chemists in selecting future chemists, or could a mixed panel of scientists? It would frequently be more convenient to set up the panels if it turned out that they could. Yet common sense says that scientists know their own field better than do their colleagues in other fields, and that they might therefore be biased in judging candidates in their own fields. Without deliberate intent, without in fact awareness of what he is doing, a judge might give a higher rating to a candidate in his own field because he understands better the candidate's research proposal, gives greater weight to recommendations from people whom he knows, or evaluates more highly grades in courses in his own field.

The Office of Scientific Personnel has studied this question of bias, in several ways, over several years, with various kinds of panels of judges, and in sufficient detail to reach a clear and convincing conclusion: there is no bias. Some candidates are rated above others, and the candidates in one field may average higher than those in another, but the differences are in the candidates, not the judges. Fellowships go to the same candidates whether they are rated by scientists in their own field or in other fields. (Details are available in the Office of Scientific Personnel's *Technical Report No. 12*.)

This is a comforting finding. It speaks well for the objectivity and integrity of the panels of judges. It means that one need have no misgivings about the use of interdisciplinary panels in selecting fellowship holders. But it leaves unanswered the more fundamental question of how often fellowships are awarded to the right, and how often to the wrong, candidates. The scientist-judges are free from bias, but that does not mean that they are free from error. The Office of Scientific Personnel is studying this point also, and in due course will have some interesting things to say about the validity of their fellowship selection techniques. It is too bad that similar studies cannot be made of the master choosing his own apprentices, for it would be fun to compare the batting averages of the two methods.—D.W.

Science

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