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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.

A Favorable Environment for Research

Most scientists require a stimulating atmosphere to realize their full creative capacity. The factor of most importance in determining a favorable environment is constructive interaction among colleagues. Discussions can generate enthusiasm and a stream of sparkling ideas. In the implementation of new concepts, members of the group can be mutually helpful. One person may remember a relevant article in the literature. Another may know of an applicable technique. As research progresses, suggestions for other approaches may open new doors. As results come in, discussion of their validity and significance can lead to a more rigorous approach and ultimately to additional insight.

Interaction among members of a research group must be continuous, with minimal intrusion of distracting influences. Indeed, it is distractions that can most readily quench creative fire or prevent it from igniting in the first place. One potent destructive influence is irritation. This can stem from outside events, but it is more likely to arise within the group itself. Jealousy and gossip can be effective poisons, and one trouble maker can ruin the spirit of a laboratory.

Recently, academic scientists have fostered a new form of distraction. A man of any stature, according to the current vogue, must have at least one nonprofessional assistant and, if he is a person of real consequence, a battery of assorted flunkies. If a scientist is doing routine development work or is administrative head of a large laboratory or department, nonprofessional help is essential. However, if his major function is to perform fundamental research, nonprofessional and even professional assistance can be a drain rather than a help. These aides may render dedicated service, but the price of this service can be destruction of the creative fire. To justify their presence and to satisfy their need for achievement, the scientist must keep them busy—must plan for them and direct them. Later he must hear the details of why things can't be done or admire the flourish with which they were done. Usually members of the staff occupy the space nearest that of the scientist and thus hold a first mortgage on his time. He finds that he has fostered not an intellectually stimulating environment but a sterile one, that he has robbed himself of some of the time needed for creative effort.

I was privileged to be a graduate student in Berkeley during the late 1930's when nuclear research was the big frontier in science and the Radiation Laboratory was one of the most exciting places in the world. The staff of the laboratory consisted almost entirely of pre- and postdoctoral fellows and totaled about 25. There were no secretaries to answer the telephone or make coffee. A machinist fabricated some parts for apparatus, but almost all the experimental equipment was made by the fellows. They also took care of the operation and repair of the cyclotron. In this purely professional atmosphere there was intense concentration on physics. Although the staff (including Professor Lawrence) performed what now would be regarded as menial jobs, their conversation at such times was largely about research.

In today's academic world many tasks are performed by technicians, and supposedly the scientists are free to do higher things. It doesn't work out that way. In practice, scientists spend much of their time being the equivalent of straw bosses in a factory. These days it is easy for a promising young scientist to surround himself with pairs of hands, but he should ask, "Is it worth while?"—P.H.A.