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The Roots of Scientific Integrity

Part of the strength of science is that it has tended to attract individuals who love knowledge and the creation of it. Just as important to the integrity of science have been the unwritten rules of the game. These provide recognition and approbation for work which is imaginative and accurate and apathy or criticism for the trivial and inaccurate.

The scientist can find many satisfactions from a new discovery. First there is growing recognition of a new truth. This is the most exciting and personally rewarding period. In contrast, the necessary confirmatory work is likely to be drudgery. Another reward can be the approbation which may attend revealing the new truth to professional colleagues. Later comes publication, followed by requests for reprints. To receive a note of appreciation from an unknown reader half-way around the world is a warming experience. Ultimately it is possible to see the truth incorporated in textbooks as a fully recognized part of the intellectual treasure of mankind.

The rewards have added significance insofar as they are in contrast to the punishments for failure. If success in research comes after a period of barrenness, the accomplishment seems even more exciting. If one has given a talk which has drawn half-hearted response or overt criticism, he values good response more highly. After a manuscript has received a scorching review, smooth acceptance on another occasion seems worth a celebration. Those who have published work rightfully castigated for inaccuracies not only experience acute discomfort but serve as a warning example to others.

The quiet personal satisfactions of work in the laboratory are important to the individual. Research, however, is just a pleasant hobby unless its results are evaluated and incorporated into the total body of knowledge. Thus it is the communication process which is at the core of the vitality and integrity of science.

Scientific meetings are often thought of as means of learning of new developments. There is another aspect fully as important which usually is overlooked. That is the effect of a verbal presentation on the speaker himself. If the event is definitely scheduled some time in advance, the impending occasion can act as a tremendous stimulus. It can cause the investigator to focus more sharply on a particular area. As the time approaches he tends to devote his waking hours either to research or to thinking about his topic. He is likely to consider very deeply the limits and certainty of his knowledge, to tighten his self-discipline, and to do crucial experiments which he has not thought of before or has only considered half-heartedly.

A similar series of effects accompanies the writing of a scientific paper. The author quickly discovers how little he knows, the gaps which must be filled.

The system of rewards and punishments tends to make honest, vigorous, conscientious, hard-working scholars out of people who have human tendencies of slothfulness and no more rectitude than the law requires.

When the game is played under different rules in an arena such as politics, it should not be surprising that the performance of scientists sometimes leaves something to be desired.—P.H.A.