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THE TRADITION OF SCIENTIFIC CRITIQUE

BY STANLEY E. BRADLEY

The American Society for Clinical Investigation upholds an old and revered tradition of service to the ideal of a scientific medicine. Within the fabric of our art the threads of learning, skill, and humanity are inseparably woven. When any one of them is lacking or unduly emphasized, the texture is weakened and defective. Unfortunately, throughout most of recorded history, medical science—so called—has been a ridiculous mixture of error, empiricism and superstition. The great physicians, from Hippocrates to Sydenham, held fast to the view that skill and humanity are both best served by an exact and unclouded knowledge of living processes, that medicine is ideally a science to be cultivated by thoughtful investigation. This tradition could not bear fruit, however, until scientific medicine became a realizable possibility with the discovery of the scientific method in the fourteenth and fifteenth centuries (1). Almost immediately civil and ecclesiastical authority proscribed the new way of thinking in the universities (2-4) and for a moment seemed to threaten its development. At this point a new and unexpected element entered the picture.

Scholars and men of affairs, drawn together by a common enthusiasm, formed learned societies to defend and exploit the new method (5). By adherence to the highest possible standards of excellence in work and conduct, by submission to an objective and balanced critique, and by setting an example of intellectual probity, these associations exerted a remarkably pervasive influence in promoting the rise of modern science. The creation of a scientific medicine was defined as a prime objective of the new movement from the very beginning (1, 4, 5). Medical men figured prominently (indeed proved essential) in the conception, gestation, birth, and growth of science (1) but the profession at large was slow in realizing and profitting by its benefits. Then, almost explosively, in the course of a single century, scientific medicine became an overwhelming reality. Again the schools were reluctant to accept the new ideas, and again scientific societies, having no official academic connection —in this country, the Association of American Physicians and the Young Turks—were needed to promote the revolution in medical teaching and practice. Our Society may take its place in the ranks of the older organizations not only because it maintains the same tradition of a scientific critique but also because its vicissitudes and problems are similar.

The idea of the learned Society had its inception in the activities of a variety of lay organizations—luncheon clubs, fraternities, mystical brotherhoods and the like—all concerned with an exploration of the new ideas generated by the rejection of ancient authority. Out of these emerged the first organized scientific society, the Accademia del Cimento, founded in Florence three hundred years ago in 1657 by the Medici family (5). North Italy had been a "forcing bed" of the method and it is not surprising that during the 10 years of its existence the Florentine Academy was able to attract a remarkable group of men whose publications provided a kind of laboratory manual for the development of early scientific investigation. The English were not far behind the Italians and they built more lastingly. In fact, the Italian organization was patterned upon a Utopian research institute sketched out by an Englishman—the "House of Solomon" in Francis Bacon's *New Atlantis*. Bacon's program also formed the basis upon which the Royal Society of London was incorporated in 1660 (6). Academies of science sprang up in France and Germany under the same influence.

The Royal Society survives today as a vital and vigorous institution despite a long history of typical ups-and-downs (6). Approximately a third of the founding members were professionally trained and intellectually disciplined scholars; the remainder were political, military and even ecclesiastical notables with an avocational attitude rather than a primary dedication to the new science. This division persisted for years—at first beneficially, later with detrimental effect. The prestige resulting from the ,patronage of the Crown, the nobility and men of wealth did much initially to enlist popular sympathy and support. The amateurs provided an enthusiastic and intelligent audience but unfortunately they brought ridicule and derision upon the Society. Their extravagant speculations and absurd preoccupations gave substance to the scoffers' claim that learning produced a gullible crack-pot interested only in the exotic. Strong leadership and the work of the more critical members tended to counteract this picture during the early eighteenth century but by the end of the century the Society had again fallen into disrepute. The non-professional element had tended more and more to regard the organization as a social club, nomination was tantamount to election, and scientific ability did not weigh as heavily as social position and religious views in determining membership. To make matters worse, new, apparently competitive, scientific organizations began to appear; on the one hand, devoted to the cultivation of special fields such as botany and geology and, on the other, concerned

with the general political and social interests of all scientists, as typified by the British Association for the Advancement of Science. With the growing complexity of mature scientific disciplines, a professional attitude of responsibility, stability, and dedication to a stern critique was needed for continued progress. Reorganization of the Royal Society in the 1840's with the establishment of a membership policy designed to limit the membership and to assure suitable qualifications brought the professional attitude to the fore in its affairs. As a result of insistence upon a high standard of excellence in its membership, publications and other activities, the Society quickly regained a position of leadership and fills today a unique position occupied neither by the special societies nor by the British Association, a position in which it embodies and exemplifies the best in scientific critique.

The parallels between the story of the Royal Society and our own need not be labored. We, too, are faced with the problems posed by an unsettled membership policy, by an ill-defined relationship to other groups, and by pressure for expansion. Throughout its long history the Royal Society exerted a remarkable influence primarily because it set the highest possible standard of excellence. With a falling away from the standard its influence waned, to be re-established only with restoration of the standard at a high level. Our Society also has stood for quality, for the highest possible standards of excellence in membership, in the Journal and in the papers presented before this meeting. We can celebrate the tercentenary of the foundation of the learned Societies in no more fitting way than by rededicating ourselves to that ideal.

To the best of my knowledge no conscious plan was ever laid down to attain our Constitutional objectives, but the size and interest of the audiences we are privileged to entertain each year suggest that the Society may have been successful in spite of itself. Medical education has undergone an extensive revision in the years since the first meeting and there is good reason to believe that many members played a major role in the process. In time the triumph of the ideals to which those men subscribed gave lustre to the Society. The standards they established in selecting members reflected great credit upon and gave distinction to the fact of membership itself. The Journal benefitted as a result of the conspicuous quality of the papers it was able to attract. The conscious emulation of the accomplishments of the founding members has done much to promote "the cultivation of clinical research by the methods of the natural sciences" throughout this country and to encourage "the diffusion of a scientific spirit."

Of even greater importance has been the change in the practice of medicine during these years. There is little doubt that now science and practice are closely blended, a result born of dire and urgent necessity. In no other group of professional workers is the scientific attitude more vital or more meaningfully a matter of life and death. Practice today is truly clinical investigation, demanding at once a vigilant critique, a full understanding of the human situation, and a knowledge of fundamental scientific techniques. As it strives to assist in maintaining a high standard of excellence in clinical research, the Society fully serves the ends for which it was founded.

No standard that lacks a divine sanction is readily acceptable; resentments, jealousies, fears, a host of varied considerations combine to raise up an active opposition to it. In each generation the intellectual standards, which professional men live by, must be tested and reaffirmed. This fact was abundantly confirmed in the history of the Royal Society and we should not be surprised that we also must face up to what we are apt to call the "anti-intellectualism of our time," as if it were a problem uniquely ours. Today we are confronted by a widespread assault upon science in medicine. Lip service is paid to its rewards, but an astonishing effort is expended in traducing it. The "scientific spirit," for which this Society stands, is said to produce a cold disinterested character, to dry up the milk of human kindness, whereas a training in social and emotional welfare at the expense of scientific discipline instills by some magic all the human instincts. This is essentially an attack upon standards, an attempt to condone amateurism by redefining it, an effort to make the easy way the right way. I, for one, cannot accept the implication that thought and feeling are incompatible, that the emotional response can somehow supersede, and even take precedence, over an intellectual evaluation. As long as we accept the principles upon which this Society was founded, I think we are all committed to a balanced criterion in which truth and spirit are interlocked; an unattainable ideal perhaps but one vital to progress. The tendency to dissociate feeling and intellect has disastrous effects upon judgment. It provides an excuse to dispense with critical integrity; to measure our friends and our own interests against a different standard than the one we use for outsiders, or to take the easy road of approving of everything and every one in a wonderful world. Unhappily, an unfavorable decision is wounding and difficult of tactful explanation, obviously subject to error, often creating the false impression of intellectual arrogance.

Criticism of the Society is especially acrid in connection with the choice of new members. In eight years of work on the Council of this Society I can say with pride that I have never seen any consideration other than merit take first place in determining nomination though geographical discrimination is often urged upon us. At present the membership is distributed through the land in approximately the same proportion as the population at large. The Western states are somewhat favored in the selection of our officers since every President appoints a nominating committee of three, one each from the Eastern, Central, and Western states and the three nominees selected are usually distributed in the same manner. In this way some 14 per cent of our membership can control one-third of the official positions. This would seem to be a wholly justifiable method of giving encouragement to the West but merit alone should determine our selection of candidates for membership. More recently there has been pressure to increase the membership on the assumption that the number of new

members should be determined by the number of men nominated. The history of the Royal Society shows the fallacy and danger of this assumption. If we wish to allow for the growth of the research establishment in this country, we might gear membership to the number of workers listed in American Men of Science, or better yet, to the number of subscribers or contributors to the Journal of Clinical Investigation. Certainly the number nominated is a poor criterion of anything but the prestige of the Society.

We come now to the scientific session. The papers selected for presentation here have been picked from more than 200 submitted. An honest effort has been made to take the best from a group of excellent titles without reference to subject, geography, or personalities. This is not an easy task; it is certainly never discharged to everyone's satisfaction. Nor are these easy papers. Medicine is a hard and demanding mistress today, always on the move, always changing her focus and concentration. What we learn today will tomorrow seem commonplace, foolish, or obsolete, but now it is new and difficult. As long as progress is being made this must be so; there is no advantage in not facing the fact and swallowing the bitter broth of novel and complex concepts. We must seize upon our facts where we find them, whether by the bedside, at the laboratory bench, or in the animal quarters. In its broadest possible sense clinical investigation is as deeply concerned with the metabolism of the viral particle or animal cell as it is with the behavior of the whole man. Every fact, concept, or method that may have some ultimate bearing upon the problems that face us as physicians should have a hearing in this Hall.

We perpetuate a long and proud tradition that goes back at least 300 years, an intellectual tradition of undaunted critique and of adherence to a high standard of excellence. In these yearly rites of Spring we pay tribute to that tradition and to the view that medicine is a scholarly profession steeped in mercy and dependent upon a devoted skill. To be effective, head, heart, and hand must work as one.

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