9 April 1976, Volume 192, Number 4235

SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

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Scientific Quests and Governmental Principles

Basic science is now on the defensive. It is being assailed by groups and governments as being costly and dangerous, as being silly or ominous. Now that modern biology, for example, has achieved some mastery over genetics, various scenarios of deliberate intrusion into the human gene pool are being rehearsed, almost always with more anxiety than insight. These fears reflect our society's failure to understand the fundamental process of basic research and its relation to our historical and legal heritage. As a result of this failure, the ever-growing influence of scientific invention and technology has terrified us as much as it has given us peace.

In no age of Western history has a philosophical procedure been so tacitly accepted and used without understanding as has science by modern governments. I believe this is so because the people who govern are no longer in a sensible position to make wise decisions based on the advice of a Mandarin bureaucracy of scientific specialists. Our legislators are in that predicament because their present education and legal discipline simply exclude any understanding of the procedures and disciplines of scientific research. This is true for three reasons. First, science is not so complicated as it is abstract and far removed from ordinary sensory experience. Like the law, it requires discipline and training to become familiar with its abstractions. Second, only recently have historians and sociologists of science begun to show us the difference between the generative or creative aspects of science and its formulation and application in teaching. In the ignorance of their findings, science is usually experienced as a dead collection of facts rather than a characteristically human cultural activity. And third, legal precedent, which is the pillar of Anglo-Saxon law, has so far largely failed to incorporate the changes brought about by the impact of new scientific knowledge upon our lives and societies.

We have not two cultures, but two disciplines, the politico-legal and the scientific, and they very rarely intersect. Because of this, we are faced with two extreme ideological positions—scientism and anti-scientism. Both are dangerous as well as erroneous. Such ideological conflicts can be understood historically, but in order to understand their true basis and fully resolve them, we must understand how the brain itself produces thought and language. In our search for new knowledge, we have not yet fully committed ourselves to take on this most challenging and important task. When we know better how the brain works, I believe that we will better understand the relationship between scientific facts and those facts and ideologies that are not susceptible to verification in a laboratory.

Until we have some scientific comprehension of the basis of knowledge itself, how can we deal with the difficulties posed by the separate customs of the disciplines of science and the disciplines of government? The main problem is how to encourage a higher level of understanding by scientists and lawyers of each others' discipline. There are short-range and long-range approaches to this problem. The short-range approach is one of testimony. Some have suggested that adversary proceedings are the only way in which scientific issues bearing upon society can be democratically handled. The essential difficulty is to decide who shall conduct such proceedings—the scientists or the lawyers. Resolution of this difficulty can only come by testing various alternatives in real situations.

The long-range and more substantial approach is to revamp our educational systems in law and science to provide a wider view of the fundamental questions in each discipline and to deepen the understanding of both the limits and the powers of their particular procedures. For now, we must continue to find ways to mix at least some legislators into our scientific brew (not to give us grants but to share our excitement) and to persuade more scientists to join the polity not as advisers but in political roles themselves.—GERALD M. EDELMAN, *The Rockefeller University, New York*

This editorial is adapted from a paper presented at the symposium, "Beyond Tomorrow: Trends and Prospects in Medical Science," held at The Rockefeller University, 8 March 1976.