

Giving the soft sciences a hard sell

The longstanding rupture between the natural and the social scientists should be healed

Last week, the National Academy of Sciences rejected Harvard professor Samuel P. Huntington, a prominent political scientist, for membership. The vote, the second rejection of Huntington in two years, reflected a bitter clash of views between "hard" scientists, such as mathematicians and chemists, and "soft" scientists like Huntington who study social, political and behavioral sciences. The following essay was written by a supporter of Huntington's bid for membership in the NAS.

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Last week's rejection of Harvard University professor Samuel P. Huntington for membership in the National Academy of Sciences has elicited wide public debate. But what we should be thinking about are effective ways of relating the natural and the social sciences — an issue that is vital not only to the academy but to the nation.

In our society, many public-policy matters are technical and complex and can be dealt with wisely only if good scientific and technical knowledge is brought to bear on them. I need only mention acid rain, nuclear energy, AIDS, SDI, teen-age pregnancy, creationism vs. evolution, tobacco and cancer, technological unemployment and treatment of mental illness — culled from an infinitely longer list of topics the National Research Council, the academy's action arm, has considered in recent years.

Of course, we can't turn these matters over to the "experts." Even if the experts knew the answers — which they often don't — all important policy issues are as much matters of value as of fact, matters of balancing conflicting goals and interests and of allocating available resources. But if the experts can't decide these questions in a democracy, still we must have their input if we are not to make unnecessary and costly blunders.

A cooperative effort

The knowledge needed to think wisely about these issues does not come exclusively from any single field of science. Physicists and radiation biologists need to be heard on the topics of nuclear energy and disarmament; but scientists who study human behavior need to be heard also. Three Mile Island and Chernobyl were not simply physical phenomena; they were examples of human failure under stress. They involved human organization and public reaction to cataclysms quite as much as they involve radiation and its medical consequences. Psychology, political science and sociology are as deeply involved as physics or biology in telling us how to prevent such disasters or deal with them when they occur.

Science is not a body of knowledge, of facts and theory; it is a collection of methods for gathering knowledge, drawing conclusions and testing both against facts. Science is a commitment to disciplining one's thoughts and imaginings with factual evidence. In the last four centuries, that commitment has gradually built up the marvelous picture of the cosmos, of elementary matter, of life, of the human mind and of a society that constitutes the basic science of today. It has also enhanced, and sometimes threatened, human life by constructing powerful technologies based upon scientific knowledge.

Social and behavior science is simply the same commitment to evidence, applied to the behavior of human beings — of ourselves. Human behavior is observable in many ways and is analyzable by many techniques. It excited the interests of scientists from early times. The first mortality tables were published by John Graunt in 1662, and the first calculations of life annuities by the astronomer Halley in 1693, just seven years after he assisted Newton with the publication of "Principia." Adam Smith published his great book in 1776. Cournot's pathbreaking

work on mathematical economics appeared in 1838, a generation before Maxwell wrote out the basic equations of electromagnetism.

It is therefore silly to debate whether social science is possible — it has existed for 300 years, at least. Today, it has tens of thousands of practitioners, committed to the discipline of evidence, about 175 of whom are members of the National Academy of Sciences. As a result of social-science research, we know an enormous amount about the human species, ourselves, that early generations did not know. We apply a wide range of social-science techniques — opinion polling, psychological testing, economic analysis, learning theory, operations research — to an equally wide range of important practical affairs: elections, personnel selection, business cycle management, education and business decision making.

The number of questions to which social scientists don't know the answers is vast. But science never promises that it has the answers, only that, in trying to find them, it will submit to the discipline of evidence. The questions not answered by the physical and biological sciences are vast, too. When I chaired an academy committee, a few years ago, to advise the Senate on the revision of the Clean Air Act, I found that natural scientists were unable to estimate, within a factor of 100, the magnitude of the health effects of air pollution. All science, natural and social, strives to improve its answers, but only within the limits of the evidence it can produce. We are far from predicting the exact time of thunderstorms in Boston, or of the next earthquake on the San Andreas Fault, or the flutterings of the stock market in New York.

Doubts about social sciences

The value of applying the methods of

science to physical and biological phenomena is nearly universally accepted. There is still some controversy about applying these methods to our own behavior. Despite the many facts that scientific research has revealed about the economy, about the workings of our political system and about the processes of the human mind when it is learning or solving problems, some people continue to doubt whether social science does or can exist.

I will not speculate about the origins of those doubts; whatever their source, they have had important social consequences. They led, for example, to severe cuts in social-science budgets in the first years of the Reagan administration, cuts that have since been largely, though not completely, restored. As a consequence, we now have poorer social statistics than we should have to understand what is going on in our society, and the pace of analysis of social phenomena has been somewhat slowed.

Among natural scientists, one can find a wide range of attitudes and beliefs about the social sciences, but a substantial majority of leading natural scientists welcome and support the application of scientific method to understanding human and social phenomena. Until about 15 or 20 years ago, only a small area of social science (mainly physiological psy-

chology and physical anthropology) was represented in the National Academy of Sciences and the National Research Council.

By the decision of the natural science members, the NRC was broadened about 1965 to cover the whole scope of the social sciences, and, about 1970, the structure of the National Academy of Sciences was altered correspondingly. As I mentioned above, the social-science membership of NAS has since grown to 175, nearly 12 percent of the total NAS membership, a number roughly commensurate with the research PhD production of the several fields of science.

These changes were made for at least three major reasons. First, ~~scient~~ scientists recognized that a substantial body of researchers were applying the fundamental methods of science to human phenomena and striving to advance these methods. Second, associating these researchers with their natural-science brethren in the National Academy of Sciences would strengthen their influence in their own disciplines and contribute to improvement in the methods of social-science research.

Third, and most important, the National Research Council, required by its charter to advise the federal government, needed to be able to offer advice of the highest scientific quality over the whole range of questions involved in public policy. To provide responsible advice on air quality, economists were needed as well as atmospheric scientists and doctors. To advise on AIDS, the social and psychological factors that determined the spread of infection needed to be understood. To advise on armament policies, the psychology of "deterrents" need to be analyzed, as well as the physics of nuclear explosions.

The social and behavioral sciences are supported solidly in our universities. As we have seen, behavioral sciences have become an integral part of the federal structure for providing scientific and technical advice to government. Their research is funded, though not well or adequately. They face a great challenge to continue to advance, both to give us a deeper and more valid understanding of our own minds, hearts and social structures and to help steer public policies and directions consistent with a realistic knowledge of the world.

As they proceed in their task, the social sciences will continue to encounter skepticism from some quarters. Social scientists will also continue to work in close and cordial cooperation with many colleagues from physical and biological sciences who recognize the essential place they have in the whole picture of science. The best way for them to meet the skepticism they encounter and to justify the confidence their colleagues place in them is to do their work well.

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