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The Changing Ingredients of Foreign Policy

It is a common observation that the progress of science and technology is the predominant force causing today's unprecedented rate of change in man's physical and social environment. Nowhere are the changes more evident than in international affairs, where the scientific and technological developments during and since World War II have sharply altered former relationships among nations, overturned traditional measures of power and influence, and made the future a hostage to the scientific discoveries that are uncertain in form but sure to come.

It was the atomic bomb that in the public mind swept away the elegant but fading separation of science and international affairs. But developments in many other areas — jet aircraft, nuclear submarines, missiles, space technology, and high-speed communications — were equally responsible.

Science and technology affect the international scene not only as the causes of change, however. They also have entered into the substance of international relations and thus into the heart of the foreign policy process in all nations, and particularly in technologically advanced nations such as the United States. With increasing momentum, the subject matter in international relations, the execution of foreign policies, and even the conduct of diplomacy directly involve, or are heavily influenced by, science and technology. The foreign policy process today must face issues, facts, and relationships that are entirely new or startlingly altered from the past. Moreover, the resolution of many of these issues is highly sensitive to a rapidly changing technological environment — an environment changing either by design or, more often, in unplanned and uncertain ways.

There has been little systematic effort to probe the character of the relationship of science and technology to the substance of foreign policy, although there have been intensive studies in depth of some of the new issues of foreign policy, such as atomic energy or space exploration. Broader studies that attempt to examine the actual interactions of science and technology with foreign affairs are sadly lacking.

The absence of such systematic study is of concern in its own right, for the pervasiveness of the relationship indicates that it ought in principle to be developed and more widely understood. A more immediate practical motive for mounting such a study is the need to evaluate the effectiveness of the mechanisms in the U.S. Government designed to cope with relevant aspects of science and technology in the formulation of

foreign policy. Are these mechanisms adequate to the task? Has there been real recognition of the opportunities science and technology offer as new instruments of policy? How well is the government able to recognize and plan for the uncertain technological future?

There is, in fact, ample justification for concern that the foreign policy organs of the American government, and particularly the Department of State, are not adequately organized to deal with science and technology in the formulation and execution of foreign policy. Several important innovations in the government have been made in recent years for the purpose of coupling science to policy making more effectively, but the results of these innovations are uneven. In particular, the Secretary of State's role as chief foreign policy adviser to the President is in increasing jeopardy because the Department has been unable to find ways to develop the necessary scientific/political competence. As many of the issues that face the Department come to include highly sophisticated scientific or technological elements, its ability to keep itself free of domination by the more technical agencies of government depends directly on its understanding of the interaction of science and foreign policy, and its own ability to deal with that interaction. President Johnson's directive early in 1966 for a broader role for the Secretary of State will have a hollow ring if that understanding and ability are not better achieved.[1]

The objective of this study will therefore be twofold: first, to provide that systematic analysis of the relationship of science and technology to foreign affairs that

[1] *The New York Times,* March 5, 1966, p. 1.

is a necessary prerequisite to understanding; and second, to explain and evaluate the organization, within selected government agencies, designed to reflect that relationship in the policy process.

A PATTERN OF INTERACTION

Many of the central issues of foreign policy, such as military affairs, arms control, international influence and prestige, and foreign economic assistance, have important, occasionally dominating, scientific or technological elements. Other areas of foreign policy concern may also have significant scientific or technological elements, even though the relevance of those elements may not be as obvious or as persuasive.

As a way of ordering the discussion, it is useful to make a gross classification of foreign policy issues according to their technical content. In effect, such a classification is a guide to the probability that the scientific or technological aspects will be relevant in specific kinds of issues, and thus a guide to those areas that call for extensive analysis.

Five categories of foreign policy issues can be enumerated:

1. *Issues associated with dominant technical objectives:* Those issues in which the *technical* objectives, even if established to achieve basic political goals, set the framework for policy making. Space and the peaceful exploitation of atomic energy are good examples. So, too, is the advancement of science in programs such as those of the International Geophysical Year.
2. *Issues of a political nature heavily dependent*

on scientific considerations: Those issues that arise because of, or have been significantly altered by, advances in science and technology and that continue to be sensitive to scientific considerations. In distinction from the first category, the political objectives here more dominantly set the framework. National security policy is a good example, as are issues associated with international organizations or exploitation of ocean resources. Included as well would be the issues that arise from the emergence of scientists as an influential pressure group concerned with international political problems.

3. *Issues of a political nature not sensitive to technical factors:* Those issues that may have been altered in a general way by advances in science and technology, or that may even have arisen because of advances in science and technology, but that in the short run are not heavily dependent on technical variables. The problem of disposing of surplus agricultural products in other countries is a good example.
4. *Issues associated with the application of scientific methods to the policy process:* Those issues and opportunities that grow out of the application of the techniques and analytical tools of the sciences to foreign policy problems. These are essentially issues in the social sciences: the validity and limitations of simulation techniques, war games, and survey analysis.
5. *Issues associated with the implications of future developments in science and technology:*

> Issues arising from possible or probable developments in science and technology. The international implications of control of the weather or control over man's genetic patterns are examples, as are more far-reaching queries about national freedom of action, control of territory and decentralized decision making on the international scene in an era in which the developments of science and technology may have altered traditional concepts.

There are no hard and fast separations between these categories for they are designed to be useful for analysis rather than absolute. In most cases, it is the perspective from which the issue is viewed that determines the category in which it should be considered. If broken down far enough, every technical program of the government could be seen as complete unto itself, with its technical objectives dominating associated political issues. Carried to the other extreme, every government program is ultimately carried out for a political purpose, even the support of basic research, in which case it could be said that technical objectives never set the framework within which policy must be considered.

Neither extreme is useful as a point of departure. The classification presented here proves workable and meaningful for purposes of analysis and to obtain a rough structuring of the subject. Parts II and III of this study will be devoted to the development of the first two categories, although many of the ideas presented will also bear on the last category — that most elusive and speculative subject of the implications for world affairs of future developments in science and

technology. The concluding chapter of this study will also be concerned with that last category.

One consideration that must be borne in mind when assigning issues to specific categories is the uncertainty associated with initial judgments as to the relevance of science and technology. The seemingly technical nature of an issue, say international atomic energy policy, is not always a good indicator of the actual importance or relevance of technical considerations of specific facets of the subject. Policy issues with respect to the International Atomic Energy Agency, for example, are often concerned with administrative, budgetary or political matters in which the scientific aspects of the exploitation of atomic energy are of minor relevance.

The reverse is also true. That is, the seeming lack of relevance of scientific considerations is not a sure proof that they are not important. A good example is the planning of policy for international trade negotiations such as the "Kennedy-round" of tariff talks. On the surface, scientific aspects would appear to be of minor importance. Yet such negotiations are planning for trade patterns for many years in the future. It is entirely possible, even likely, that scientific developments now in process will have a profound effect on the export or import interests of quite a few countries, and within a very few years.

And, what is of greater importance, it may be possible consciously to direct R & D resources toward a particular objective that would affect trade patterns in desirable ways. An example would be the acceleration of oceanographic research off a nation's coast in an effort to make that country self-sufficient in (or even an exporter of) fish and protein resources. Another ex-

ample would be a domestic R & D program aimed at finding a substitute for a necessary but politically costly import.

Thus, scientific and technological factors may be highly relevant to some part of an issue, even when a first look would not have indicated the need for inclusion of technical elements. It is not an easy matter in the policy process to protect against the neglect of scientific and technological factors, when their relevance is not initially obvious. And the difficulty of this situation puts a premium on an effective mechanism for broad integration of science and technology in the nation's foreign policy agencies. Part IV will be concerned with that mechanism.

POLICY MAKING IN FOREIGN AFFAIRS

The literature analyzing the policy-making process in foreign affairs in the United States is extensive and growing.[2] Though there is little point in a general summary of the excellent studies that have been done, there are several particular aspects of the present situation in the Federal government that have an important bearing on how well scientific and technological elements can be coupled to the other elements of foreign policy issues in the policy process.

One important observation is the uncertain power of the State Department in the formulation and execution of American foreign policy. The responsibility for foreign policy is, of course, centered constitutionally in

[2] One of the best sources that relates directly to the changes in international relations induced by postwar advances in science and technology is John H. Herz, *International Politics in the Atomic Age*, (New York & London: Columbia University Press, 1959).

the President; traditionally, the Secretary of State and his Department are expected to be the President's chief foreign policy advisers and pre-eminent in government councils on foreign policy matters.

Today, the scale and scope of American overseas activities, and the direct relationship between domestic and foreign affairs, have tended to dilute the State Department's role. The situation at any time varies markedly with the relationship between the President and the Secretary of State. Even when the relationship is close, there are now many more actors in the scene, with inevitable effects on the State Department's influence.

The most prominent of these new actors are in the White House and Executive Office of the President, for recent Presidents have found it necessary to establish sizable staff arms to help them maintain their influence in the Federal bureaucracy. The National Security Council, of course, but also the Bureau of the Budget, the Office of Science and Technology, as well as individual Presidential assistants are involved in issues stemming from or affecting America's foreign relations. Conflicts of power and influence between these staffs and the State Department cannot be avoided; they may also be encouraged by the President as a means of surfacing alternative policy choices or policy innovations.

Beyond the Presidential staffs, many departments and agencies of government have a legitimate say in the making of foreign policy, and some of them have enormous financial and political resources with which to exert influence on the course of events overseas, on the Congress, and on the public at large.

Moreover, these other departments and agencies can be thought of as technical agencies in the sense that they are fully cognizant of detailed technical matters within their responsibilities that may influence foreign affairs. They are more cognizant, certainly, than any other agency not directly concerned with the same subject matter, and therefore in a position to influence policy by their near-monopoly of technical information.

Largely for these reasons, the Department of State is not in the dominant position it often enjoyed in the past. It must fight constantly to make its views heard, and on issues that depend on specialized knowledge in the hands of the technical agencies it is at a great disadvantage unless able to understand how that specialized knowledge affects political choices. How President Johnson's call for greater control by the Secretary of State over international operations of the government will affect the Department's position, if at all, is not clear.

The President, too, must face this problem of gaining ascendancy over the technical agencies. He also must have independent sources of information and analysis if he is to be able to evaluate and supplement the choices presented to him and keep the agencies "honest." The creation of the post of Special Assistant to the President for Science and Technology in 1957, discussed in detail in Chapter 11, stemmed directly from this need as perceived by President Eisenhower.

The role of the Congress in foreign affairs is also quite different than in the past, especially on those issues with high technical content. The Congress has a major responsibility, of course, in foreign policy formulation not only as a result of its treaty ratification,

appointment, and war-making functions, but also by virtue of its appropriation and investigatory powers.

But this responsibility is increasingly difficult to exercise except in relatively minor emendations of the wishes of the Executive Branch. The enormously increased pace of events, the drastically altered meaning of power, and the greatly increased scale of American worldwide involvement, all of which are in some measure the result of the scientific revolution, have worked to reduce the Congress' ability to carry out its responsibilities. The Executive Branch has the responsibility for action and control of the information. The information problem is particularly serious when issues depend heavily on technical variables, for the Congress until now has had only marginal internal capability for understanding the scientific and technological elements of foreign policy issues and relating them to the political choices open to the nation.

A few Congressional committees have worked to overcome the information problem, notably the Joint Committee on Atomic Energy. But the record is spotty and results more often in frustration and ex post facto criticism than in positive influence on policy formulation.

One other aspect of the foreign (or any) policy process deserves mention to dispel any lingering notions that it is inherently an orderly process. It might seem to be desirable to have policy made in a theoretically rational manner, with goals clearly defined, all relevant information taken into account by policy officials selected for their objectivity, and decisions clearly taken and executed. The actual process, fortunately, bears only a distant relationship to such a model.

Rather, national goals are very rarely explicit or, if they are, almost always prove to be too general to apply to specific cases. Decision makers recognize that information gathering to reduce uncertainty, as Herbert Simon notes, is costly.[3] The decision makers themselves approach issues with limited information, with prior biases and with external pressures that are in turn based on partial information and special interests.

The policy process is better characterized as a series of partial decisions; in fact, there often may not even be discrete events that could be called decisions.[4] Instead, the set of premises with which a decision maker approaches a problem may dictate a policy choice without his conscious realization that a choice was involved.

[3] Herbert A. Simon, "Theories of Decision-Making in Economics and Behavioral Science," *American Economic Review*, Vol. XLIX (June 1959), p. 272.

[4] Bauer, Pool, and Dexter showed this well in their exhaustive study of the politics of foreign trade. Their conclusions about decision making included:

> It often seemed to us that the term "decision-making" was a misnomer. What we saw did not often warrant so intellectual-sounding a label. . . . Not only may the formulation of a problem not have taken place deliberately, but the decision, also, may not have been deliberate. Under the pressure of circumstances a man does something that seems small, and suddenly he finds himself committed to something much larger than he envisioned . . .
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> In any study such as ours, the question of whether a decision has been made at all should be regarded as a moot point. It is an issue that should be settled on empirical grounds in each instance. The label "decision-making" probably cannot be abandoned entirely, but it is necessary to call attention to how far this phrase fails to describe what happens in a social group between the time that an issue is recognized and the time that one or more persons are committed to a course of action.
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> Raymond A. Bauer, Ithiel de Sola Pool, and Lewis Anthony Dexter, *American Business and Public Policy* (New York: Atherton Press, 1964), p. 482.

Or, actions taken on apparently minor aspects of a problem or for short-term purposes may lead to seemingly inevitable or "obvious" policies at a later time on bigger issues. It is a common occurrence to have a program or policy established to meet a particular isolated need develop a life of its own that conditions future policies in other issues.

It is also a common occurrence to have major policies made in the context of preparing a speech. The Point Four Program under President Truman resulted from just such a situation, as did the Atoms for Peace proposal of President Eisenhower and the joint lunar program proposed by President Kennedy at the United Nations in 1963.[5] As Dean Acheson has noted, "The despised speech, often agreed to be made months beforehand without thought of subject, a nuisance to prepare and an annoyance to deliver, has proved the vehicle for statements of far-reaching effect for good or ill."[6]

Thus, the policy- or decision-making process is complex and seemingly disorderly, and further complicates the problem of relating scientific considerations to policy making. Decision makers in foreign affairs normally will have only very limited information available on the technical aspects of the issues they face, and often inadequate appreciation of the character of the interaction between those technical aspects and the political choices open to them. Often, the time available to ex-

[5] See discussion of these space and atomic energy initiatives in Chapter 2.

[6] Dean Acheson, "The President and the Secretary of State," in Don K. Price (ed.), *The Secretary of State*, The American Assembly, Columbia University (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1960), p. 44.

plore the technical aspects, even if their relevance is realized, is short. And when technical information is sought, the tendency is to seek "expert" testimony—specific answers to specific questions — when in fact the significance of the technical elements may be their uncertainty and their dependence on the political alternatives.

These problems of injecting science and technology effectively into the foreign policy process in the face of the complexity of that process in the United States, emphasize the importance of understanding the nature and character of the relationship between science and foreign affairs. In turn, such understanding is a prerequisite to designing policy machinery that, if adequately manned, can make possible that necessary integration.

SOME DEFINITIONS

Semantic debates about the terms "science" and "technology" can plague any analysis of a subject concerned with their social and political implications. Attempting to provide precise definitions can also be a source of debate, however. The distinctions between basic and applied research are typical of the problem in that there is no objectively observable boundary between them; the difference, in fact, depends on the purpose for which the distinction is to be made. Definitions of a few basic terms are necessary, but they will be presented arbitrarily with a view to avoiding irrelevant argument while making the analysis of maximum usefulness.

This procedure does not deny that the very real dis-

tinctions between science and technology are of great importance in the fields themselves and in the formulation of government policy for research and development; the distinctions occasionally are also pertinent to the analysis of foreign policy issues. But that pertinence is usually of a descriptive kind not fundamental to the analysis. For example, describing the technical aspects of the Atoms for Peace Program as technological or scientific is of little consequence in analysis of the political effects of the program.

Moreover, to attempt constantly to maintain a distinction between what is basic research and what is development inevitably raises difficult questions of definition that are, in fact, not relevant to the major argument.

Hence, science as used here will be treated as a generic term intended to encompass the entire research and development enterprise. This usage avoids the constant repetition of the phrase science and technology and conforms to common practice, at least among nonscientists. To most laymen, the term science includes the development of equipment and the application of the methods of science as well as the systematic study of phenomena to discover general truths. It is recognized that use of the term science in this way will offend some, for it is quite true that technology is often slighted or misunderstood by being subsumed under science. But because the distinction has little substantive importance for this particular analysis, there is more to be gained by using a term that corresponds to general public understanding than there is by continuing an awkward and possibly distracting distinction.

Occasionally it is necessary to be more precise, as in

discussions of the role of various kinds of research and development in foreign assistance programs. At those times, analytical distinctions between research and development will be carefully observed. Often the description of some components of an issue as scientific or technological means simply that they are of a technical nature in a field of science or technology (as opposed to finance or economics or law). "Technical" can also serve, therefore, as equivalent to "scientific" when the meaning is clear, and will be used in that way.

A different and more substantive problem is whether to include the social sciences in the analysis. There is no question of the importance of the interaction between the social sciences and foreign affairs; the very study of foreign affairs in a systematic way is, of course, part of the discipline of political science. However, the focus of interest in this analysis is the interaction of the physical and life sciences with foreign affairs. It would be a mistake to blur that focus, without doing justice to the broader subject, by including the social sciences as an appendage to the "hard" sciences. Accordingly, the term science is not intended to include the social sciences. Where in the course of analysis there are relevant points to be made about the social sciences, they will be referred to explicitly.

The terms "scientists" and "engineers" warrant somewhat different treatment because they involve somewhat less semantic debate, and the distinctions can be easily maintained. Moreover, there are important differences in the characteristics of the science community as opposed to the engineering community which bear on the analysis. Most often, the individual himself de-

termines the community with which he identifies. For this analysis, scientists are considered to be those individuals engaged in basic or applied research, in the systematic search for new knowledge whether or not specific applications are in mind.[7] The term will be meant to encompass not only scientists in physical and life science fields, but also those in the social sciences.

The term engineers will refer to those primarily engaged in the application of knowledge to the development of specific technological end items such as equipment, processes or products. Many engineers, particularly in universities, are engaged in what has come to be called the engineering sciences. Here the work is heavily research oriented, for it is devoted to advancing the techniques, knowledge, and tools required in engineering. Still, most of those engaged in this work consider themselves engineers notwithstanding the indistinct boundary between their field and the sciences. They, too, will be considered engineers, for it is their own view of their affiliation that is most important.

[7] Whether a scientist is engaged in basic or applied research is often simply a difference in point of view: The administrator with an application in mind may see it as applied research; the scientist interested in the subject without reference to possible application may see it as basic research. Dr. Walsh McDermott of Cornell University offers the best definition: "The work you or your immediate colleagues are doing is clearly basic research; all other research is applied."