

- progress," *Proc. Amer. Philos. Soc.* 94, 339 (1950); reprinted in (10), pp. 29-49; "Dual role of the *Zeitgeist* in scientific creativity," *Sci. Mo.*, 80, 101 (1955), reprinted in *Psychologist at Large* (Basic Books, New York, 1961), pp. 325-337.
17. R. K. Merton, "Singletons and multiples in scientific discovery; a chapter in the sociology of science," *Proc. Amer. Philos. Soc.*, 105, 470 (1961).
  18. W. F. Ogburn and Dorothy Thomas, "Are inventions inevitable?" *Polit. Sci. Quart.*, 37, 83 (1922).
  19. R. K. Merton, "Resistance to the systematic study of multiple discoveries in science," *European J. Sociol.*, 4, 237 (1963).
  20. M. Planck, *Scientific Autobiography and Other Papers* (Philosophical Library, New York, trans. 1949), p. 33f.
  21. E. G. Boring, "The psychology of controversy," *Psychol. Rev.* 36, 97 (1929); reprinted (10), pp. 67-84.
  22. W. Wundt, "Auch ein Schlusswort," *Philos. Stud.* 7, 633 (1892).
  23. C. Stumpf, "Mein Schlusswort gegen Wundt," *Z. Psychol.*, 2, 438 (1891).
  24. A. Koestler, *The Watershed: A Biography of Johannes Kepler* (Anchor Books, Garden City, N.Y., 1960).
  25. M. A. Tinker, "A study of the relation of distracted motor performance to performance in an intelligence test," *Am. J. Psychol.* 33, 578 (1922).
  26. E. G. Boring, *Psychology for the Armed Services* (Infantry Journal, Washington, D.C., 1945), p. 119.
  27. G. Holton, "Scientific research and scholarship," *Daedalus* 91, 362-399 (1962), esp. 371-375.
  28. See also Merton (19), esp. p. 278f.
  29. R. K. Merton, The ambivalence of scientists, *Bull. Johns Hopkins Hospital* 112, 77 (1963).
  30. See also Merton (19), esp. pp. 252-258.
  31. W. James, "Chauncey Wright," *The Nation* 21, 194 (1875); reprinted in E. H. Madden, *Chauncey Wright and the Foundations of Pragmatism* (Univ. of Washington Press, Seattle, 1963), pp. 143-146.
  32. E. B. Titchener, "The past decade in experimental psychology," *Am. J. Psychol.* 21, 404-421 (1910), esp. 405.

## News and Comment

### Goldwater: An Effort to Evaluate the Effects That His Election Might Have on Scientific Activity

For various reasons it is difficult to try to assess what effects a Goldwater presidency might have upon the federal government's far-reaching and intimate relationship with science and technology. This is not only because Congress, public opinion, and the complexities of public affairs often create a sizable difference between presidential desire and accomplishment, but also because it is politically sufficient for a candidate to present himself as "pro-science" without going into very much detail. This stance is aided by the fact that few issues involving science lend themselves to politically partisan formulations. In addition, Goldwater's designs for government represent such a profound departure from what has prevailed since New Deal days that there is no reliable way of evaluating their general effects on the country or their particular effects on the special interests of the scientific community. Nevertheless, there are some clues as to what might happen in the scientific and technical realm if the Senator should succeed to the White House.

The most significant, of course, is that Goldwater has emphatically declared himself for a more vigorous

effort in military research and development. With the Defense Department's R&D budget now somewhere in the neighborhood of \$7 billion a year, it would be difficult to argue that the military is not utilizing a generous share of the nation's scientific and technical resources, but the appetite of the military for new weaponry is understandably boundless, and there is no doubt that if substantially more money were available, it would promptly be put to work.

Whether an expansion of military R&D would have a detrimental effect on other fields of research is something that is fogged by the numerous unknowns of scientific and engineering manpower utilization and federal budgeting. The principal beneficiary of an expanded military effort would be the aerospace industry, which is currently suffering from excess capacity. This has been brought on by the administration's refusal to build a new manned bomber fleet and also by the approaching completion of the intercontinental missile force. Thus, it appears that a good deal of manpower and facilities are available for great new undertakings in the development and production of strategic weapons, but it is not at all clear that this could be accomplished without financial effects on some of the other programs that are lumped together under the budgetary heading of research and development.

Congress may eventually accept more realistic concepts when it comes to evaluating federal support for research and development but at present, the dominant tendency is to place a single price tag on the entire national scientific and technical effort. The resulting figure, now around \$16 billion, tends to create pressures all along the line for economy and slower growth, and if the overall total were suddenly swollen by a major increase in funds for military research, it is not likely that innocent civilian bystanders such as the National Institutes of Health and the National Science Foundation would benefit. Ideally, these agencies should not suffer from an expansion of activity in remotely related fields, but things don't work that way; at least, they have not so far, even under an administration that has been prodding Congress to expand the budgets of the agencies responsible for financing basic research. Throughout the 1950's the boom in defense-related research had a beneficial spill-over effect, at least in financial terms, on the basic sciences, but that was before R&D had come to account for so prominent a part of the federal budget. Now that it totals some 15 percent of annual federal outlays, hard choices are being made and some worthy projects are being passed up or delayed for no other than financial reasons.

In any speculation on what fiscal fortunes might await science and technology under Goldwater, it is significant that the Senator in his public utterances and votes over the years, has reacted to the growth of the federal budget as the unholy of developments. It is plain, however, that Goldwater's anti-spending instincts do not apply across the board, but rather apply to government expanding authority abroad and reducing it at home. The called-for boost in military research is one example of an exception to the

Senator's aversion to bigger budgets. And last May Goldwater voted in favor of an \$845 million authorization for a research, treatment, and construction program for treating mental illness. But it is no secret that the Senator wants to cut back on federal spending and although he has not specifically committed himself on government support for science, it is difficult to see how this large slice of the federal budget could remain unaffected by a general atmosphere of domestic austerity. Goldwater's Senate votes offer no very clear guidance on how he feels about the federal science budget. For various reasons, people from different parts of the political spectrum can come out in the same place on the usually non-political matter of money for research. In 1962, for example, Goldwater, in company with a number of liberals, unsuccessfully sought to cut the NIH budget by \$60 million. Apparently this vote had nothing to do with his attitude toward research but was simply an outgrowth of his sentiments for keeping down federal spending. Whether the view from the White House would induce different sentiments is something on which there can be no more than speculation, but, with rare exceptions, whenever the opportunity presented itself, Goldwater has been for less, rather than more, money for all domestic programs, scientific and otherwise.

One matter with scientific implications on which there can be considerably more certainty involves the thriving exchange program which has grown up between the United States and the Soviet Union. In the course of his extensive expressions of views on foreign policy, the Senator has clearly indicated thoroughgoing hostility toward this program, and, if words mean anything, it is difficult to see how a Goldwater administration would tolerate the continued East-West traffic of the scientific and cultural exchange. In *The Conscience of a Conservative*, Goldwater stated:

The exchange program, in Soviet eyes, is simply another operation in Communist political warfare. The people the Kremlin sends over here are, to a man, trained agents of Soviet policy. Some of them are spies, seeking information; all of them are trusted carriers of Communist propaganda. Their mission is not cultural, but political. . . . It would not have made sense, midway in the Second World War, to promote a Nazi-American exchange program or to invite Hitler to make a state visit to the United States. Unless we cherish victory less today than we did then, we will be equally reluctant to treat Communist agents as friends and

welcome guests. The exchange program is a Communist confidence game. Let us not be taken in by it. . . .

Views like this are not easily reconciled with cooperative agreements on research in desalinization, atomic energy, and space, or with cooperative efforts in oceanography and the Antarctic, nor are they likely to accommodate the continuation of programs under which Soviet and American scientists visit and work in each other's laboratories.

Presidential platforms generally tend to be on the vague side, but they offer some instruction on a candidate's thinking, and the platform written at San Francisco by Goldwater's supporters presents some interesting views on the federal role in the area of science and technology. For purposes of contrast, it might first be noted that the 1960 Republican platform contained a section headed "Science and Technology," which opened as follows:

Much of America's future depends upon the inquisitive mind, freely searching nature for ways to conquer disease, poverty, and grinding physical demands, as well as the science of space and the atom.

We Republicans express our profound gratitude to the great scientists and engineers of our country, both in and out of government, for the remarkable progress they have made. . . . Our continuing and great national need is for basic research—a wellspring of knowledge and progress. Government must continue to take a responsible role in science to assure that worthwhile endeavors of national significance are not retarded by practical limitations of private and local support.

The 1960 plank on science and technology then went on in a vein that generally reflected the nonpolitical consensus which, since World War II, has prevailed on most matters involving science and government. ("The vigor of American science and technology may best be inspired by . . . an environment of freedom and public understanding in which intellectual achievement and scientific research may flourish. . . .")

#### 1964 Approach

The Goldwater platform did not choose to indulge in such homilies about how science works best, and its references to science were sprinkled throughout discussions of other matters, rather than reserved for a separate section. In a section headed "Failure of National Security Planning,"

subtitled, "Losing a Critical Lead," it charged that the administration "has delayed research and development in advanced weapons systems. . . . Its misuse of 'cost effectiveness' has stifled the creativity of the nation's military, scientific and industrial communities."

The platform went on to say, under a heading of "Retarding Enterprises," that the administration "has sought to weaken the patent system which is so largely responsible for America's progress in technology, medicine and science."

And, under the heading of "Fiscal Irresponsibility," it stated that the administration "has undertaken needlessly expensive crash programs, as for example accelerating a trip to the moon to the neglect of other critical needs such as research into health and the increasingly serious problems of air and water pollution and urban crowding." (Just how these judgments can be reconciled with some of Goldwater's votes in the Senate is difficult to see. Last September, for example, the Senator voted against a measure to increase federal grants for sewage-disposal plants, and, as was noted in this section two weeks ago, Goldwater is not against a big space program, he is simply against a *civilian* space program. But platforms are of a genre which do not demand tidiness.)

#### "Sound Research Program"

"The Republican Alternative," as the platform called it, would provide for "continued Federal support for a sound research program aimed at both the prevention and cure of diseases, and intensified efforts to secure prompt and effective application of research. This will include emphasis on mental illness, drug addiction, alcoholism, cancer, heart disease, and other diseases of increasing incidence."

Toward these and other goals, and under the heading of "Faith in the Competitive System," the platform called for a number of measures, including an end to the "ceaseless pressing by the White House, the Food and Drug Administration and Federal Trade Commission to dominate consumer decisions in the market place."

Expressing "Faith in Limited Government," the platform next called for "a replanning of the present space program to provide for a more orderly, yet aggressively pursued, step-by-step development, remaining alert to the danger of over-diversion of skilled per-

sonnel in critical shortage from other vital areas such as health, industry, education and science."

And, it concluded, under a heading of "Freedom's Shield—and Sword," with a pledge to "revitalize research and development programs needed to enable the nation to develop advanced new weapons systems, strategic as well as tactical."

The platform's failure to match its predecessor in paying court to science may possibly be the result of nothing more than the Goldwater camp's desire to concentrate on a few key themes. But the suspicion arises that the relatively brief attention to science and technology may have something to do with what appears to be a dearth of support and advice for Goldwater within the leadership of the scientific community. There may, in fact, be an ample supply of Goldwater supporters among scientists, but extensive inquiry in the scientific community and Goldwater headquarters in Washington has failed to turn them up. A query to the offices of Citizens for Goldwater in Washington brought the reply that "there is no (scientific) advisory group at this time, but in the course of the campaign, the Senator will turn to such recognized authorities as he may find necessary."

Just who these authorities will be is not clear at this time. Because the Senator and the distinguished physicist Edward Teller share the same views on nuclear testing, it has been thought by some that perhaps Teller would assist the Goldwater campaign. A telephone inquiry to Teller brought the curt reply, "I have not been asked," and no further comment. Associates of Teller report that he has been angered at published reports that he is associated with the Goldwater campaign, and they state that he is not interested in helping Goldwater. The campaign, of course, is just now getting organized, and it is possible that if the Republicans deem it sufficiently important, they can come forth with a solid group of scientific advisers. Whether it is really important to do so is another matter, but it has become the style for political figures to have at least a scientist or two in camp, and at this point it must be noted that none is in evidence in the Goldwater entourage. (When asked whether he knew of any prominent scientists working for Goldwater, one of the administration's science advisers commented,

"Eighteenth century politicians don't have science advisers.")

By contrast, there appears to be a great deal of ferment among scientists and engineers opposed to Goldwater. No formal organization has yet been announced, but sometime within the next few weeks, a rather blue-ribbon group of scientists and engineers—including several who have previously been associated with Republican politics—is expected to announce its support for Johnson.

However, a number of scholars outside of the scientific community, but still within the academic realm, principally in economics, have been associated with the Senator. According to *The Congressional Quarterly*, an authoritative weekly report on political affairs, the following are among persons in various professions whom the Senator "has frequently called upon for aid and advice in his successful campaign for the . . . nomination": Economists Karl Brandt, of Stanford; Milton Friedman, of the University of Chicago; Gottfried Haberler, of Harvard; Warren Nutter, of the University of Virginia; Raymond J. Saulnier, of Columbia; Gerhart Niemeyer, a Notre Dame political scientist; and Robert Strausz-Hupe, director of the Foreign Policy Research Institute at the University of Pennsylvania. Though not listed in the *Congressional Quarterly* report, Stefan Possony, director of the International Studies Program, Hoover Institute, Stanford, has also assisted the Senator.

#### Personal Interest

It has often been noted that the Senator's personal interests run to things technical, and from this it has been inferred that he would be eager to promote scientific and technical activity. The step from personal interest in flying, electronics, and photography to active governmental promotion of science and technology is not necessarily inevitable, but the Senator's familiarity with and liking for technology do suggest a degree of sympathy that would at least make him very accessible on scientific and technical matters. Just how much personal interest in this area would weigh against the various forces for weapons research and economy that might be put in motion by Goldwater is another matter.

Also in question is what would happen to the elaborate scientific advisory apparatus that has developed virtually apolitically since it was started during

the Eisenhower administration. Many of those who were given advisory roles under Eisenhower had no difficulty in serving the Kennedy-Johnson administration and, with few exceptions, many of those serving in the current administration would have had no qualms about serving Nixon if he had defeated Kennedy. (In 1960, the historian Arthur Schlesinger, Jr., a Kennedy adviser, saw fit to produce a campaign tract titled, "Kennedy or Nixon: Does It Make Any Difference?" It is not likely that the current campaign will bring a similar work.) On the basis of an admittedly limited survey of current scientific advisers, it appears that anti-Goldwater feeling is of an intensity that would make it unlikely for the Eisenhower-Kennedy-Johnson group to feel very much at home with the Senator in the White House. Views differ, however, on whether there would be a mass exodus. Some say that even if invited to stay, they would move on, but others express the view that if given an opportunity to remain in an influential position, they would prefer to do so, rather than yield their authority to persons politically sympathetic to Goldwater.

—D. S. GREENBERG

#### Announcements

The National Conference of Standards Laboratories (NCSL) has issued a call for information to be included in its **Directory of Standards Laboratories in the United States**. For the purpose of the directory, a standards laboratory is considered "any industrial, governmental, academic, or scientific group or organizational unit of technically trained persons, working under professional direction, engaged to a significant extent and on a continuing basis in the calibration of measurement standards and instruments." NCSL has a questionnaire which laboratories are requested to complete for inclusion in the directory. A laboratory need not be a member of NCSL to participate. The questionnaires are available from Harvey Lance, National Bureau of Standards, Boulder, Colorado 80301.

An institute for **molecular virology** has been established at St. Louis University's medical center. The major program will be fundamental research in molecular virology and cancer; the center will also provide work for medical and graduate students and for post-