

Science in the News

Nixon on Science: Policy Paper Emphasizes Basic Research; Calls for Special Institutes

The Vice-President issued the second of a series of position papers last week, this one on "The Scientific Revolution." Its major proposal was for the organization of more interdisciplinary research institutes, along the lines of Brookhaven National Laboratory (for research in peaceful uses of atomic energy).

Nixon singled out the recently proposed national meteorological institute as a good example of what he had in mind. He said the field was being inadequately supported (only 14 Ph.D.'s in meteorology were graduated last year), and he pointed out that the heavy investment in equipment would probably be beyond the reach of any one institution. He noted, in particular, the need for a center in which specialists in the various interested disciplines would work closely together to their mutual advantage. The paper summed up the case for the institutes by emphasizing the increasing interdependence of the more specialized fields.

"A logical extension of the nascent merging of different sciences in a common cause," the paper said, "is the mutual use of theory, techniques, and instrumentation which were once the province of a single science. This fusion has created a new dimension in science. Its fulfillment is usually beyond the ability of our conventional research structure."

Nixon said the institutes would not be "controlled, financed, or operated," by the federal government, but that the National Science Foundation should "take the leadership in sponsoring" the institute, which would be "established cooperatively by our universities which engage in graduate research programs" and "governed by boards created by these universities." Nixon said the federal government would contribute funds to match those made available by state and private contributions.

The paper said such institutes would play a growing role in future years, both as research centers and as training grounds for graduate students, but that "they should in no way preempt the role of the university, nor its separate and valid claim for our support." The paper contained no indication of the size of the institute program, of how much federal spending might be involved, or of how actively the federal government might take the lead in encouraging the universities to establish the proposed institutes.

The proposal for more research institutes took up about a third of the 3000-word paper. The remainder contained nothing to startle or offend anyone, other than those who might criticize it for what seemed to be a lack of sense of urgency. Nixon said that science is important, that scientists are important, and that we ought to appreciate this importance, both of science and the men who work in it, more than we have in the past.

He said that, while the Soviet Union is ahead of America in a few limited areas, particularly high thrust rockets, the United States remains clearly ahead of the Soviets in over-all scientific achievement. He said that the Soviet lead in a few areas is a reflection of their ability to use the powers of the state to compel a heavy concentration of their resources in a few areas given high priority. "In contrast," Nixon said, "their efforts in fields such as medicine are relatively mediocre as compared to ours."

Nixon said the public should understand the importance of basic research. He said Americans tend to be impressed by the practical advances of science, but to be unaware of the basic research that makes the advances possible. "Very few of us," said the Vice-President, "have an adequate conception of the endless hours spent by scholars studying the electron, hours without which we would not have our television sets."

Nixon recalled a briefing he had attended at which Herbert York, director

of defense research and engineering, talked about what might be learned from space exploration. He said York concluded his exposition by telling his listeners that they could forget all the specific points he had mentioned if they would only remember that the most important thing to be learned from space exploration probably wasn't included in the briefing because no one could now conceive what it might be.

As for recommendations, Nixon began by saying "we must make the necessary education available to those who have the desire and the ability." But there were no specific recommendations on this, perhaps because Nixon has already gone on record as favoring an expanded program of federal scholarships and student loans. At least so far as the paper goes, Nixon does not see any present or imminent shortage of scientific personnel. "Given these creative men and women," he said, "—and we are fortunate we have so many of them—what must we do to aid them to . . . help us meet the challenge." And a little further on, "We have among us the creative men and women to meet the challenge."

Nixon said "we must encourage and back [the scientists] to the utmost." He cited the need for giving scientists "the freedom to explore," for supplying them with adequate facilities ("seismographs, oceanographic ships, astronomical observatories, or whatever is the need"), and seeing that funds were available for "adequately salaried collaborators, assistants, instruments, and supplies."

Background of the Paper

Last month Nixon announced the organization of a group of a dozen key policy advisers in various fields, whose duties are to include the preparation of position papers in their various special fields. Some of these might be used as the basis for speeches, others, considered less suitable for delivery at a political rally, would be issued, like the current paper on science, as policy statements. The principal sources of the science paper were Joseph Kaplan of the UCLA physics department, who served as chairman of American activities during the International Geophysical Year, and John H. Heller, New England Institute for Medical Research. Their version was heavily rewritten by Nixon and by James Shepley of *Time-Life*, who took leave to become chief of staff of Nixon's policy advisers.

The unavoidable political orientation of any statement issued during the

campaign explains such peculiarities as the talk of awarding federal assistance through a system of "matching grants." Matching grants with the spending of state governments (as opposed to out-right grants) has become one of the keystones of Republican orthodoxy. But any matching that comes about under such a project as the National Meteorological Institute is likely to involve a very big federal grant to "match" modest contributions from universities and the foundations.

The report of the National Academy of Sciences committee which recommended the establishment of the institute called for a capital investment of \$50 million over a 5-year period and an annual operating budget of \$15 million. All the money would come from the federal government, although some NSF officials hope that there would eventually be some contributions from private sources.

Similarly, Brookhaven National Laboratory, cited by Nixon as an example of what he has in mind, is supported almost entirely by the federal government. Brookhaven cost the government \$30 million last year in direct support.

A few researchers and a small amount of equipment were financed by the participating universities, but even here the actual money often came from a grant the government had given to the university to support the scholar or to buy the equipment.

Contributions from state governments and private industry, as a practical matter, are not likely to be important. Even on programs like slum clearance and road building, where the benefits to the state are very direct, the federal government often contributes \$4 or more to every dollar put up by the state or local governments. In the case of the research institutes, where the benefits are clearly to the nation, rather than to the state in which the institute might be located, no one really expects more than token participation by state and local governments or by private business. Thus, the institute program will almost certainly depend on how willing a Nixon administration would be to go beyond the terms of the paper, which specifically says the government will not finance the institutes. It is difficult to find anyone who believes that Brookhaven would exist or that the proposed institute for meteorology is likely to come into existence unless the federal government is willing to put up the money.—H.M.

News Notes

Radiation Limits Reduced to One-Third Present Levels by Atomic Energy Commission

The Atomic Energy Commission has established sharply lower limits for radiation exposure by amending its regulation for the protection of employees in atomic energy industries. Therefore, the radiation limit for members of the general public beyond the confines of atomic plants is also radically changed, for the rule is that the public may not receive more than 10 percent of the maximum exposure permitted radiation workers.

The new restrictions, which go into effect on 1 January 1961, will reduce the allowable life-time accumulated dose of radiation received by workers to approximately one-third the amount allowed under the regulation as it now stands. The total external radiation exposure that any worker may accumulate beyond the age of 18 will be lowered to an average of 5 rem per year and to not more than 3 rem in any one quarter. Present limits for radiation workers are 0.3 rem per week (or approximately 15 rem a year), without further restrictions as to accumulated dose.

[A rem (roentgen equivalent man) is a radiation dose of any ionizing radiation estimated to produce a biological effect equivalent to that produced by 1 roentgen of x-rays.]

National Committee Proposes Limits

The radiation exposure levels now in effect are based on the 1957 recommendations of the National Committee on Radiation Protection, a group of radiation specialists who work for government agencies, including the AEC, and for private institutions. The new radiation limits are designed to bring the commission's regulations into accord with the current recommendations of the National Committee.

The committee emphasizes that the lowering of the limits should not be interpreted as indicating that exposures at levels currently permitted by the regulations have caused damage. The NCRP says that the changes, rather, are based on a desire to bring radiation standards into accord with new trends of scientific opinion and to reflect awareness of the probability of a large future increase in radiation uses.

Soviet Scientist Describes Dogs During Space Flight

The reactions of the Soviet dogs Belka and Strelka while they were orbiting the earth in the U.S.S.R.'s satellite spaceship last month were described as follows in the Soviet press by P. Fyodorov, one of the scientists who watched the telecast transmitted from the ship's cabin during flight.

"At the moment of the start the dogs pricked up their ears and looked in bewilderment at the floor of the cabin: What was that unusual noise? During the first seconds of the flight the dogs were worried and tried to rush about. As the ship's speed was accelerated, the dogs were gradually pressed to the floor by the increasing force of gravity. Strelka tried to resist by pressing firmly with [her] legs and anxiously looked around her. Then the animals stood stock-still. The ship had reached its orbit.

"After the great overload, a condition of weightlessness set in. The dogs found themselves in mid-air in the cabin, their paws and heads limply lowered. At first glance the animals seemed lifeless.

"I will not conceal the fact that we were greatly worried during those minutes. Only the readings of the telemetric system reassured us: The pulse and respiration of our travelers gradually returned to normal. We realized that the animals were simply resting after all the 'excitement' experienced during the take-off and were becoming accustomed to the new and extremely unusual sensations.

"Gradually they started to raise their heads and move their paws. Everything was unusual: It was not so simple to manage their own paws in such strange conditions. Belka even became angry and started to bark; but one gradually becomes accustomed to everything, and the animals became accustomed to the condition of weightlessness. They started to eat. . . .

"There were times during the flight when they again became alarmed, but gradually they began to feel at home."

The television system aboard the satellite is reported to have provided valuable motion-picture films. The recording of the images was synchronized with the recordings of telemetric information, making it possible to compare direct observation of the animals with data on the changes in their physiological functions.