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NEWS AND COMMENT

The National Academy of Sciences: Profile of an Institution (II)

At 9:30 a.m. on 24 April 1950, the 87th annual meeting of the National Academy of Sciences was called to order by President Alfred Newton Richards. When the meeting ended the next day, vengeance had been exacted in a vendetta seething since World War II. As a consequence, though it is doubtful the members had this outcome in mind, the Academy entered a period of growth and activity unprecedented in its long and drowsy history.

The meeting, attended by 201 of a membership then totaling 461, opened with a brief business session at which Richards went through the formality of announcing what the members already knew: He had notified the Council of the Academy that in June, upon completing a 4-year term, he would leave office. J. Robert Oppenheimer offered a resolution of appreciation for the retiring president, who, in his 74 years, had distinguished himself as a pharmacologist and research administrator. The resolution was adopted. Various items of routine business followed. Notice was given of the deaths of five members since the last meeting, and appointments were made to a number of committees. Invitations had been received for the Academy to send representatives to various scholarly and ceremonial proceedings. It was announced that a member would attend the 10th International Ornithological Congress in Sweden; "greetings" would be dispatched for the installation of a new president at Geneva College, in Beaver Falls, Pennsylvania. And so forth. At 9:50 a.m., the business meeting was adjourned. Scholarly proceedings were scheduled for the rest of the day, but it is doubtful that scholarship was uppermost in the minds of many members. Rather, it is likely they were thinking of the following morning, when the Academy would vote on Richards' successor.

Now, since decorum characterizes the Academy's proceedings, and the academicians are not the stuff of which juntas and coups are easily made, elections of Academy officers are usually placid, predestined affairs at which the Council, upon recommendation of a nominating committee, serves up one candidate per office. In preparation for Richards' retirement, the decision-making apparatus of the Academy had produced a candidate of the most sterling distinction, Harvard president James Bryant Conant, whose attainments as a chemist had brought him Academy membership in 1929 at the unusually early age of 36. At the beginning of World War II, along with his fellow academicians, Vannevar Bush, president of the Carnegie Institution of Washington, Frank Jewett, president both of Bell Laboratories and of the Academy, and Karl Compton, president of M.I.T., Conant had led the mobilization of the scientific community and had played a key part in establishing the Manhattan Project. During the war, as chairman of the National Defense Research Committee, he was second only to Bush in the far-flung military research enterprise that came under the Office of Scientific Research and Development (OSRD). Following the war, the highest levels of government regularly sought his counsel on the new complexities of military technology, strategy, and international diplomacy.

In the long history of the Academy, one would have had to go back to the great physicist and Smithsonian secretary Joseph Henry to find an individual of comparable scientific stature, political *savoir faire*, administrative experience, and dedication to the public service. In fact, it is possible that the Academy elders coveted Conant's lustrous reputation more than Conant coveted the Academy presidency. He had taken little part in Academy affairs. There may have been a good reason, but he was not present for the election meeting, and he was so heavily engaged with duties in Cambridge and Washington that it is likely that he would have followed tradition and viewed the Academy presidency as mainly an honorific position. Nevertheless, the presence of his name on the ballot established the fact that he was willing to take it.

However, at the instigation of Conant's fellow chemists, the rank and file of the academicians present were not willing to give it to him.

The motivations for what transpired on that day 17 years ago are now difficult to discern. The minutes record

only a few bare facts, some of the principal figures are dead, and today many of the academicians acquainted with the episode tend to regard it as an embarrassing incident unsuited for discussion outside the family.

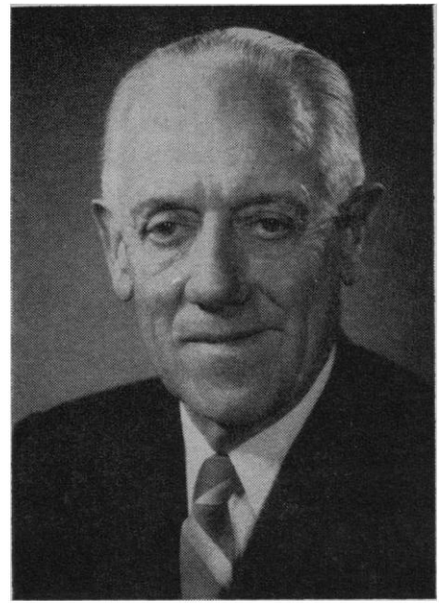
Among a group of chemists there was a feeling that, during World War II, Conant had been excessively authoritarian in dealing with some of his colleagues. Details are hard to come by, but the resentments were there, and some of his fellow academicians relished paying off a long-held grievance.

One academician, who was then living in Washington, recalls that a chemist was his houseguest during the Academy meeting. "He arrived in a very excited state, and was very agitated about Conant. He said that Conant had rubbed the chemists the wrong way during the war, and he was calling people up to get them to vote against Conant. I don't know anything about it, and I don't even remember how I voted, but my friend was terribly excited about the whole thing."

As soon as Conant's name was placed in nomination, an alumnus of the Office of Scientific Research and Development, the late Wendell M. Latimer of the Berkeley chemistry department, rose to propose another candidate: Detlev W. Bronk, president of Johns Hopkins University, chairman of the National Research Council, long a devoted laborer in Academy affairs, and the nominating committee's selection for the office of Foreign Secretary. Another OSRD alumnus, the late Victor K. LaMer of the Columbia chemistry department, seconded Bronk's nomination. The minutes record that Bronk, who by all available accounts was unaware of the chemists' plan of rebellion, "requested that his name be withdrawn but the Academy failed to honor his request. A ballot was taken with the result that a majority of votes cast was for Mr. Bronk." The minutes go on to state that a telephone call was placed to Conant, who made "the urgent request . . . that the election of Mr. Bronk be made unanimous. On motion duly put and seconded, Mr. Bronk was unanimously elected."

There are those who say that after the election Conant never again set foot in the Academy building.

A few months after the episode, which Conant refuses to discuss, he became chairman of the National Science Board of the newly established



Detlev W. Bronk, President of the Academy from 1950 to 1962.

National Science Foundation. But he resigned that post after 1 year, though remaining as a Board member for another 2 years, to devote himself to other matters. In 1953 he left Harvard to become U.S. High Commissioner to West Germany, and then went on to his present role as the single most influential critic and reformer of American education. It is doubtful that bestowal or denial of the Academy presidency could have had any effect on the luster of his name, but it is likely that repudiation by his fellow chemists was a humiliating experience.

With the election of Detlev W. Bronk the Academy presidency came into the hands of one of the most remarkable, industrious, highly honored (he holds more than 45 honorary degrees), ubiquitous figures ever to rise in the scientific community. After service as a naval aviator in 1918 and 1919, Bronk received a doctorate in physics and physiology at the University of Michigan. Distinction came to him through his researches in infrared spectroscopy, volume flow of blood, and physiology of the sense organs and nervous system. In 1939, when he was elected to the Academy at age 42, he was director of the Johnson Research Foundation at the University of Pennsylvania. During World War II he was coordinator of medical research for the Army Air Force. In 1946 he became chairman of the long-neglected appendage of the National Academy of Sciences, the National Research Council. NRC was to be his principal vehicle for modernizing the Academy, but first NRC would have to undergo a great deal of remodeling.

NRC was spawned during World War I out of dissatisfaction with the long history of indifference that had prevailed between the U.S. government and the Academy. The charter of 1863 stated that "the Academy shall, whenever called upon by any department of the Government, investigate, examine, experiment, and report upon any subject of science or art. . . ." The stipulation of "whenever called upon" provided a firm rationale for passivity, and occasionally still does. Thus it is not surprising that, in its first 50 years, the Academy had been asked to provide counsel on all of 53 matters. Some were important, and the Academy can be credited with a major role in initiating the creation of the Geological Survey, the Forest Service, the Weather Bureau, and the National Bureau of Standards. But, in the main, the Academy was asked, when it was asked at all, to advise on trivial matters such as the selection of stone for a customs house in Chicago, and "Preservation of Paint on Army Knapsacks." Looking back on this dismal World War I record, and inspired by a desire to bring science to a scientifically illiterate government, George Hale and a number of his Academy colleagues concluded that what was needed was an auxiliary organization that would function as the operating arm of the Academy. Thus NRC was born in 1916.

Operating under the authority and prestige of the Academy charter, NRC, as they conceived it, would be a loose federation of many of the nation's leading scientific and technical societies, organized into disciplinary sections, and served by a full-time staff in Washington. Underlying their interest in creating this auxiliary to the Academy was the plain fact that, while the academicians eagerly accepted the Academy's prestige, they generally disdained its work. The genius of the NRC concept was that it would greatly enlarge the pool of talent that the Academy could call upon for advisory services, and it would do this without in any way diluting the prestige of Academy membership. For, while the academicians would continue to reap the honor, the NRC advisers would do most of the work.

It was a sound idea, and under Bronk it ultimately came to bloom. But NRC was only moderately effective

Election to the Academy, according to its publication, *Organization and Members, 1946–65*, is "in recognition of distinguished contributions to scientific and technological research." How well does the Academy perform in recognizing such contributions? If the Nobel prize is the ultimate measure of scientific and technological creativity, as it is almost universally considered to be, it would appear that the Academy occasionally suffers blurred vision. For in nine instances since 1950 the Nobel prize has been awarded to scientists in this country who had not been elected to Academy membership at the time of the award. In all but two instances, election was subsequently bestowed upon them.

Following are the Nobel laureates and the dates they received the prize; the year of election to the Academy is in parenthesis:

Polykarp Kusch, 1955 (1956); Chen Ning Yang, 1957 (1965); Tsung Dao Lee, 1957 (1964); Owen Chamberlain, 1959 (1960); Donald A. Glaser, 1960 (1962); Dickinson W. Richards, 1956 (1958); and André F. Cournand, 1956 (1958). The late Philip S. Hench, who died in 1965, won the Nobel Prize in 1950 but was not elected to Academy membership; nor was Frederick C. Robbins, who won the prize in 1954.

during World War I, and after the war it nearly succumbed to one of the chronic political infirmities of the scientific community: *part-time-itis*. None of the distinguished statesmen of science who endorsed the idea was willing to stay full-time in Washington to see it through. Between the wars, the Academy and the Research Council settled back to being a rather languid combination, most notable for judicious administration of the NRC fellowships and for a running quarrel, of long-forgotten substance—if ever there was any—between NAS president William Wallace Campbell and NRC chairman Isaiah Bowman during the period 1933–1935, when their terms overlapped.

By and large, the record was still not an inspiring one in 1946 when Bronk became chairman of NRC. But under his leadership NRC began to evolve into a fairly bustling operation, with an annual budget in 1950 of nearly $5.6 million. Some $1.8 million of this was provided by the Atomic Energy Commission for carrying out one of the very few operational—as distinct from advisory—functions ever undertaken by the Academy: the Atomic Bomb Casualty Commission study of long-term effects of the atomic bombings of Japan. (The task fell to the Academy because the Japanese felt assured that it would conduct an objective, disinterested study.) The rest of that $5.6 million was mainly for sustaining the activities of an amorphous collection of hundreds of committees that, often without rhyme or reason, came under, or stood outside, NRC's organization into divisions on international relations, mathematics, physical sciences, engineering and industrial research, chemistry and chemical technology, geology and geography, medical sciences, biology and agriculture, and anthropology and psychology. Affiliated with each of these divisions were hundreds of scientific and technical societies that provided a source of expert manpower for performing a variety of housekeeping chores for the scientific community, as well as advisory functions for the federal government.

Some of these chores were of great importance, some were routine but essential to the functioning of the scientific community, and some were trivial. The Committee on Undersea Warfare, founded in 1946 at the request of the Navy, became a fertile ground for the conception of new submarine technology; NRC selection committees regularly screened thousands of fellowship applications for government and private organizations, and their performance met with widespread satisfaction. Starting in 1946, the NRC Committee on Growth served as adviser to the American Cancer Society in dispensing millions of dollars collected for cancer research and training. (By 1956, when this relationship ended, a total of $19.4 million had been awarded.) And then there was an NRC group that reported expenditures of 8 cents in 1950 in connection with "investigation on stainless steel sheets."

As busy as NAS and NRC were, however, it cannot be said that on the eve of the Bronk presidency they stood in the mainstream of American science and technology or of the policy deliberations that were establishing a close linkage between the scientific community and the federal government. The Academy and the Council were too unwieldy and too ill-defined an organization to radiate any significant influence over such matters. Nevertheless, sprinkled throughout the history of the Academy were a number of episodes that revealed a great potential for influence and power. One of these is worth relating in some detail, for it demonstrated that the Academy could be a responsive instrument for those who knew how to play it.

In 1939, after Einstein's famous letter that sought to alert F.D.R. to the military potential of the atom, a presidential committee was set up under Lyman Briggs, director of the National Bureau of Standards, to look into the matter. Months later, the committee was still cautiously looking, to the ever-growing distress of many scientists, including Bush, Compton of M.I.T., and Ernest Lawrence, inventor of the cyclotron. The three of them decided that fission was too important to be left to a meandering study. Briggs was responsive to their suggestion that he invite the official science adviser of the U.S. government, the National Academy of Sciences, to review the subject. Compton's brother Arthur, the Nobel laureate physicist, was made chairman of the study committee formed in response to this request. Not long afterward the Academy committee concluded that an all-out research and development effort stood a good chance of producing a bomb. Armed with the conclusion of this prestigious expert committee, Bush and Conant confidently advised Roosevelt to proceed with the bomb project. And thus was born what eventually evolved into the Manhattan Project.

The Bronk Presidency

One of Bronk's first moves as president was to proclaim the Academy's authority over its amorphous and at times semiautonomous auxiliary, NRC. "There have been times when . . . ill-defined relations have fostered friction and dissent" between the parent and its sudsidiary, he declared in the Academy's report for fiscal 1950–51.

Constitutionally these relations are well defined: the Research Council is a constitutent agency of the Academy; the Research Council enlists the talents of many who are not members of the Academy.

The Academy formed the Research Council as a council of representatives of various specialized societies in order to achieve a synthesis of fragmented scientific effort. . . .

Accordingly, it is meaningless to say that the National Research Council is an active, effective agency whereas the Academy does little but elect new members. I repeat, the Research Council is a part of the Academy, and the officers and Council of the Academy are responsible for the conduct of all the affairs of the Academy including those carried out under the aegis of committees of Divisions of the Research Council.

Bronk announced that, henceforth, NAS and NRC would be drawn together under a Governing Board consisting of the Council of the Academy and the chairmen of all the NRC divisions. Thus he proceeded to weld the two organizations. In 1954, NRC was wholly divested of any remaining traces of autonomy. The overall organization came to be referred to as The National Academy of Sciences–National Research Council. And the President of the Academy occupied the theretofore separate position of chairman of the National Research Council.

It had taken some 40 years to bring life to Hale's concept of an operating arm for the Academy, but Bronk had done it.

Bronk's presidency—1950 to 1962—coincided with the forced-draft expansion of federal support for science and technology, the Korean War, the Cold War, McCarthyism, the Sputnik trauma, and, finally, the beginnings of a thaw between East and West. Year by year during his presidency the expanding role of science and technology in the nation's life was accompanied by a burgeoning of activity within the Academy, and the linkage of the Academy, mainly, in the person of Bronk, to the federal government's own expanding apparatus for dealing with scientific and technical problems. Whether the Academy's growth—to an annual budget of some $13 million in the year of Bronk's retirement—was in functional accompaniment to the growth of science and technology or the result of becoming an odd-job shop for federal agencies is a matter of some contention.

The fact is that during those 12 years, though Bronk held to the tradition of a part-time presidency, NAS–NRC became the home of an astonishing inventory of activities. Building upon past assignments and acquiring new ones, NAS–NRC was associated

NEWS IN BRIEF

•NSF LEGISLATION: The House of Representatives last week once again passed a bill by Representative Emilio Q. Daddario (D–Conn.) amending the National Science Foundation Act of 1950 to streamline NSF and to give it more authority. A nearly identical bill by Daddario (*Science,* 1 April and 5 August 1966) was approved by the House last July but failed to be considered by the Senate before Congress adjourned. The new bill (HR 5404) has now been referred to the Senate Committee on Labor and Public Welfare where it awaits hearings.

• NON-PROFIT MAGAZINES MAY FACE TAX: The Internal Revenue Service issued proposed amendments to its code last week which may have the effect of taxing advertising profits of some journals published by tax-exempt organizations. The changes, the IRS said, are aimed at clarifying the meaning of "unrelated business taxable income," and "unrelated trade or business" as they relate to certain tax-exempt organizations. The purpose of the unrelated business tax, the IRS explained, is to "remove the unfair competitive advantage which tax immunity would confer upon exempt organization businesses." The 36 pages of proposed regulations can be found in the *Federal Register* of 14 April. Before the regulations go into effect, written comments from interested parties will be received and a public hearing held.

• MEDICAL EDUCATION GRANTS: The Harvard Medical School and Brown University have each received grants of $600,000 from the Commonwealth Fund of New York to further pioneering programs in health care and medical education. The Harvard grant provides funds for two new projects in work to study and improve systems and arrangements for providing health care. The first project, a comprehensive medical care plan, is aimed at finding how medical care can be better organized and delivered more effectively. The medical school will work with affiliated teaching hospitals in implementing it. The second, a study of provision of care for a total-community will attempt to show how a community hospital—working with local physicians—could serve as the focus for comprehensive health planning and care for the entire community. The grant to Brown will be used in implementation of the graduate curriculum of its 6-year medical science program. The program was begun in 1963 and is conducted as a sequence of undergraduate and graduate studies, fully integrating premedical and preclinical education and leading to a master's degree in medical science. The first class to enter the program will begin the graduate phase next year. Other medical program grants awarded by the Commonwealth Fund include: $158,100 to Albany Medical College and $158,465 to Rensselaer Polytechnic Institute for a cooperative program of premedical and medical studies; $66,667 to the Citizens Commission on the Delivery of Personal Health Services, New York City; and $150,000 to the Academy of Religion and Mental Health, New York City.

• HARVARD LISTS FUNDS FROM CIA CHANNELS: Fifteen foundations which have served as channels for CIA funds contributed $456,000 to Harvard University programs between 1960 and 1966, according to a study prepared at the direction of Franklin L. Ford, dean of the Faculty of Arts and Sciences. The money, the study showed, went to 13 programs and activities ranging from individual research to a summer school international seminar. Humphrey Doermann, assistant to the dean, who conducted the study, used a list of foundations in the 24 February *Congressional Quarterly* as a basis for CIA-associated organizations. A major finding of the study, Doermann said, is that none of the funds came from direct front organizations set up by the CIA. The 15 were all previously existing foundations which were used to channel some CIA money. Also, there was no evidence of any unusual restrictions placed on the programs financed by the foundations, Doermann said. Among the donor organizations were: the Asia Foundation, American Friends of the Middle East, Fund for International Social and Economic Education, African-American Institute, and Rubicon Foundation.

in one way or another with an encephalitis study in Japan; studies of highway pavement, textbooks, polar research, and mutations; conferences on tropical botany, beef, transportation, and laboratory animals; and a thousand other activities. Some contend that there was acceptance of any chore tossed its way, as well as a beating of the bushes to acquire still more. But in any case the ever-growing hum of activity was not the most significant aspect of the Bronk presidency. What was most significant was the fact that, during his presidency, the Academy slowly but continuously developed as a powerful influence in the relationship between the scientific community and its new patron, the federal government. In 1956 Bronk became chairman of the National Science Board and thus occupied a key position in the formative days of the National Science Foundation. He was a White House adviser in the early days of his Academy presidency and was appointed to the President's Science Advisory Committee when that body was formally established after Sputnik. Meanwhile, in a manner reminiscent of the Compton committee's role in creating the Manhattan Project, the Academy flourished as a spawning ground for conceiving "big science" ventures to be sold to the federal government. A 1957 report by the Academy's Committee on Oceanography is generally regarded as the genesis of today's vast federal program in oceanography. The Academy was intimately involved in formulating programs for the International Geophysical Year. It provided a protective—too protective—womb for what turned out to be the Mohole debacle. During some of the chilliest days of the Cold War, the Academy, through professional acquaintanceships and, later, through a formal exchange program, maintained and nourished one of the few nondiplomatic channels for Western contact with Soviet citizens.

Thus, in 1962, when Bronk retired from the presidency, the Academy and the world around it were very different from what they were on that day in 1950 when he was the innocent beneficiary of an old vendetta. In a society that was increasingly dependent upon science and technology, the Academy now stood as a powerful instrument for influencing the growth and objectives of science and technology. The manner in which it has performed in this regard will be the subject of a third and final article—D. S. GREENBERG

Military Research: A Decline in the Interest of Scientists?

"A lot of us have finally decided that we aren't going to study war no more"—Former Defense Department official.

Since the beginning of the Second World War, many American scientists have regarded it as a duty to work on military research in times of national emergency and have often done so with enthusiasm. However, according to a number of people in the defense area, many scientists now seem to show little feeling of obligation to do military research. Rather than being rallied to the national colors by the Vietnam war, many first-rate scientists seem less interested in doing defense research, whether because of their views on Vietnam or because of other political and intellectual reasons.

Defense Department Opinion

On the other hand, officials of the Department of Defense (DOD) tend to minimize the difficulty of finding scientists to do defense work, except at the higher salary levels. The Department finds that both industry and universities are often providing more ample salaries than DOD can. While generally dismissing the problem of attracting academics, one DOD official said that he found it more difficult to find social scientists in the wake of "a strong revulsion against dabbling in other countries" which followed the furor over Project Camelot. DOD officials do not think that the Vietnam war has inspired scientists to undertake military research.

The lack of positive response to Vietnam is also noted by Gordon J. F. MacDonald, a former U.C.L.A. professor who now works as the vice president for research of the Washington-based Institute for Defense Analyses (IDA) and serves on the President's Science Advisory Committee. "There is no major desire of the scientific community to come forward and help solve this problem as they did in World War II and, to a lesser extent, in Korea. For the scientists, it is business as usual," he said, in one of a series of interviews with scientists and defense researchers conducted for this article. MacDonald does not think that Vietnam drives people away from defense work, although it was said elsewhere that one IDA researcher resigned because of his distaste for the Administration's Vietnam policy. For organizations like IDA, McDonald indicated, it is difficult to attract young people into military research and also to retain the senior people in the field. "A lot of people are bored with defense questions," he said.

Along with most other people in the field, MacDonald believes that a major cause of a declining concern for defense problems is that many scientists have become more interested in applying their talents to civilian issues, such as the problems of the cities, the poverty program, and new transportation systems. "Defense still has a negative flavor," MacDonald said. "The civilian problems are more complex; they have much greater visibility; the political consequences are likely to be greater, and they are more likely to be controversial. All these factors add to their excitement."

Another thoughtful IDA administrator, George Rathjens, Jr., head of the Weapons System Evaluation Division, exhibited some frustration about the difficulties involved in finding top scientific talent to work in military research. "You can't get those guys now; you can't get any of them," he said. Rathjens feels that there is a declining interest among topflight scientists on defense problems, but he added, "It may be fiction. I feel it, but I can't document it. I know, however, that it is pointless for me to talk to certain people." Although agreeing about the lure of the civilian sector, Rathjens attributes "disaffection" of scientists primarily to two factors: "First, there is