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THE NATIONAL ACADEMY OF SCIENCES

INTRODUCTORY ADDRESS OF THE PRESIDENT[1]

By Dr. FRANK R. LILLIE

MAY I take this opportunity of repeating what I have already said to the president of the university, how much the National Academy of Sciences appreciates this opportunity of meeting in Charlottesville as guests of the University of Virginia; and how very grateful we are for the hospitality of the university, its faculty and friends of Charlottesville and Virginia.

I would like to use my advantage as president of the academy to answer the very ancient and still natural question, "What is thine occupation and of what people art thou?"

As a corporate body the academy is seventy-two years old. It is the only scientific body that operates under a charter from the Congress of the United States, and which therefore reports directly to Congress itself. Under its charter it has control of its own membership and property, but is pledged "whenever called upon by any department of the government, to investigate, examine, experiment and report upon any subject of science or art." It necessarily has its headquarters in Washington.

To fulfil its obligations it is necessary that the academy should be broadly and strongly representative of the scientific personnel of the country; indeed, the effort to meet this necessity has determined the membership policies of the academy from its foundation: thus the division of the academy into eleven sections representing the principal divisions of science and technology to ensure breadth; and the limitation of members to secure individual and corporate

[1] Given at the dinner of the National Academy of Sciences, Charlottesville, Va., November 19, 1935.

strength. Its obligation to the nation to secure the best counsel in times of need on all questions of science and technology is a unique and heavy responsibility of this organization.

However, we are also a scientific society in our own right, and the reading of papers presenting the discoveries of members and their guests constitutes the chief function of our annual meeting held each April in Washington, and of our autumn meetings held at various universities throughout the land where we seek to improve acquaintanceship.

As you have had the opportunity of sampling our activities as a scientific society during the present meetings, I may limit my further remarks to the governmental and representative relationships of the academy. The former implies the latter; for, if we are to be of service to the government in a sense different from the very important and numerous scientific agencies of the government itself, it can only be by virtue of our capacity to bring to the aid of the government the best scientific opinion and information of the nation, and of the world, on the problems of the scientific agencies of the government. It is impossible to do this from the membership of the academy itself; and it would still be impossible even if the membership were multiplied. Hence the necessity of being a representative organization in the sense of possessing the cooperation of all the scientific organizations of the land and of their members.

Omitting any review of earlier instances of inquiries made by the academy on behalf of the Federal Government, I would like to note that the exigencies of the great war required the formation of a special agency of the academy in order to be able to carry out its obligations under its charter; at the request of President Wilson in 1916, such a special agency was organized by the academy as the National Research Council. In 1918, by executive order, President Wilson, after recognizing that the "work accomplished by the council in organizing research and in securing cooperation of military and civilian agencies in military problems demonstrates its capacity for larger service," requested the National Academy of Sciences to perpetuate the National Research Council, with much wider functions, serving in general to implement the broad charter obligations of the academy.

Under the academy and its special agency, the National Research Council, very broad contacts have been established: (1) with federal bureaus and departments, (2) with university and independent research institutes, largely through national scientific societies representing the various sciences, and (3) with engineering and industrial research through the Engineering Foundation and leading engineering societies. Many international affiliations have also been formed.

Again, in order to meet special needs of the government arising from the rapid expansion of governmental organization and activities under the economic emergency of the past few years, President Roosevelt appointed a Science Advisory Board in the summer of 1933 "with authority, acting through the machinery and under the jurisdiction of the National Academy of Sciences and the National Research Council, to appoint committees to deal with specific problems in the various departments." This has been a very important agency and has rendered numerous services to departments of the government.

Thus, the simple provision in the charter of the National Academy of Sciences—"whenever called upon by any department of the government, to investigate, examine, experiment and report upon any subject of science or art"—has resulted in the establishment of complex and powerful agencies.

With the passing of the emergencies which called the special agencies into being the academy is now combining its governmental functions into a single committee of the academy.

Functions of similar kinds have always characterized governments, their present high development is the result of a long process of evolution. In this country we can trace a fairly long history antecedent to the establishment of the National Academy of Sciences.

In the seventeenth century the great Mr. Boyle, Bishop Wilkins and several learned men proposed to leave England and establish a society for promoting knowledge in the new colony of Connecticut, of which Mr. Winthrop, their intimate friend, was elected governor in 1657.

Charles the Second would not allow such a loss to Great Britain and took them under his protection in 1661 and established a society which received the title of The Royal Society of London.

For more than a hundred years this society was for our country also what it still is for the British colonies throughout the world. Among the Americans eminent in science on the list of fellows in those early days were four from Virginia: John Banister, clergyman and naturalist; Reverend John Clayton, anatomist; John Mitchell, naturalist; and Colonel William Byrd, naturalist.

In 1743 Benjamin Franklin canvassed the colonies in an effort to establish an institution for promoting useful knowledge among the British plantations in America, to be called The American Philosophical Society, with a publication to be called the *American Philosophical Miscellany*. The society and the publication which it was planned to issue, giving the latest information on scientific subjects, failed, for the colonies were apparently not yet prepared for such inno-

vations. In 1766 another effort was made, resulting in the founding of The American Philosophical Society for the Promotion of Useful Knowledge, which is still active, and of which your own Thomas Jefferson was president from 1797 to 1815, a period of eighteen years.

The thought of a scientific body to aid the government was persistent. Washington again brought the idea to the front in his farewell address, when he said, "Promote, then, as an object of primary importance, institutions for the general diffusion of knowledge. In proportion as the structure of a government gives force to public opinions it should be enlightened." To carry his idea in part to fruition, he left in his will a bequest of $25,000 for the establishment, at the seat of government, of a national university; apparently to be primarily an institution to train men in all matters having to do with the structure of the nation. A broad interpretation of this conception of Washington has led some to believe that his thought was to make available at all times experts such as are now to be found in the membership of the National Academy of Sciences.

In 1806 in a letter to Joel Barlow (Ford Ed. VIII, 424) Jefferson advocated the affiliation of local societies with a central academy at the national capital to aid in the publication of information and to promote useful information.

Passing over a long period: the American Society of Geologists and Naturalists was founded in 1840, and in 1850 broadened its scope and became the American Association for the Advancement of Science. This body paved the way for the National Academy of Sciences, for it was at the second meeting of this body in 1851 that Alexander Dallas Bache pointed out the fact that "an institution of science, supplementary to existing ones, is much needed in our country, to guide public action in reference to scientific matters." He never lost sight of the idea, and twelve years later his efforts were finally crowned with success when, with the help of Benjamin Peirce, Louis Agassiz, Joseph Henry, Admiral Charles H. Davis and Benjamin Apthorp Gould and Senator Henry Wilson, an act was unanimously passed by Congress establishing the National Academy of Sciences.

JEFFERSONIAN "FREEDOM OF SPEECH" FROM THE STANDPOINT OF SCIENCE[1]

By Dr. ISAIAH BOWMAN

PRESIDENT OF THE JOHNS HOPKINS UNIVERSITY

IN a panel over the dais in the main hall of the National Academy of Sciences at Washington there are displayed portions of the text of Aeschylus's "Prometheus Bound," which recite Prometheus's gifts to man. Permit me to recall to your minds the setting of that drama and point out its relation to our theme.

To punish Prometheus for his audacity in carrying the gift of fire to men and thus bestowing on them the power of gods, two aides named Might and Violence, acting under the mandate of angry Zeus, rivet Prometheus's chains to a rock where, as the story runs, "the anguish of thy state shall gnaw thy heart forover. . . ." Hephaestus thought Zeus implacable and dared to say, "Harsh is every king whose power is new." In answer to the lamentations of the Chorus, Prometheus states his case. He found man "witless as a babe." Though they had eyes, men saw in vain; though they had ears, they heard not; they confounded all things; and they had their dwelling like the ant in subterranean caves, living without token of the winter's cold or "herald of the flowery spring." Prometheus revealed to them

. . . the obscure
Risings and settings of the stars of heaven.
Yea, and the art of number, arch-device,
I founded, and the craft of written words . . .
And none but I devised the mariner's car
On hempen wing roaming the trackless ocean.

. . . if a man fell sick,
There was no remedy, nor shredded herb
Nor draught to drink nor ointment . . . until I
Revealed the blends of gentle medicines
Wherewith they arm themselves against disease.

When he bestowed fire and the related arts on man, Prometheus at the same time "implanted in his heart blind hopes," because he pitied man; and for this he must endure the tortures of Zeus, albeit defiantly, with "barbed and bitter words." Appalled by his audacity the Chorus asks: "Hast thou no fear to hurl such menaces?" Prometheus replies, "What would I fear predestined not to die?" The Chorus admonishes: "Nay thou art bold . . . and too unbridled is thy tongue."

. . . new the rulers . . . throned above in heaven and
the laws of Zeus are new, framed for a harsh dominion.[1]

[1] Address at the dinner of the National Academy of Sciences, Charlottesville, Virginia, November 19, 1935.

[1] Quotations from Aeschylus, "The Prometheus