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THE NATIONAL ACADEMY OF SCIENCES[1]

REMARKS OF THE PRESIDENT AT THE DINNER

Members of the Faculty of Brown University, Members of the National Academy of Sciences and Guests:

THE National Academy of Sciences comes to Brown University with greetings to the scientific spirit that has always prevailed within its walls. The basis for this lies in the fact that since the inception of the Academy there has been a continuous liaison between Brown University and the Academy. One of your presidents, Alexis Caswell, was among the founders of the National Academy of Sciences, and members of your faculty have through the years of its existence been elected to membership in it.

In considering what it might be appropriate to say to you on this occasion, it seems to me that the custom established by my predecessors of saying first a word about the Academy, its origin and its functions is in order. This is an old story to members of the Academy and to those who have had close contact with its permanent committee, the National Research Council. To most people, however, it may not be clear as to just what the Academy is.

Although composed wholly of scientists, the Academy is *not* a scientific society in the ordinary professional sense as is the Physical Society, Chemical Society, etc. It is an organization of limited membership created by Congressional charter (the only one in the field of science) which has certain definite prerogatives and certain definite obligations to the state. These obligations in effect determine the qualifications of those elected to membership.

Principal among the obligations is the one which imposes on the Academy the necessity of giving to the government on request, and without remuneration, the best advice on scientific and engineering matters of major importance. It is this obligation which imposes the double requirement of a membership which covers

[1] Autumn meeting held at Brown University, Providence, R. I., October 23, 24 and 25.

broadly the entire field of fundamental and applied science and composed of men of established eminence in each field. It is an Academy in the true sense that every man or women elected to it has a record of proven creative accomplishment in his chosen field. It is consequently an organization of mature people.

The idea of an organization of some kind to give authoritative advice to the government in the field of science was not new at the time the Academy was chartered during the Civil War. It arose in colonial times because the question was continuously coming up with the settlers as to what could best be done with the abundance of natural resources at hand. Ways and means were considered and abandoned, only to be taken up again from time to time.

Benjamin Franklin thought the American Philosophical Society would be able to take care of investigations (that is, as to their value) and, if worth while, the members might be able to carry on the experimental work needed. Then the National Institute and later the American Association for the Advancement of Science were more or less thought of in their inception as advisory bodies to the National Government. None of them seemed to be just what was needed, however, and after considerable discussion between 1848 and 1862, the idea of founding a new body that would be recognized by Congress, to advise the Federal Government in scientific matters, to meet the needs of the time, began to crystallize. Combined with this and as a part of the broad consideration was the idea of honoring men of eminence by election to membership on the basis of their noteworthy contributions to knowledge in their fields of the natural sciences.

The Academy has had an eventful career over the seventy-six years of its existence, considering and reporting on many perplexing questions and problems which have confronted government, and the help given has fully justified the establishment of such a body.

This is neither the time nor the occasion on which to review the work accomplished in three quarters of a century of service as scientific adviser to the government. The problems have been as varied as the fundamental investigations required to adapt the magnetic compass to reliable use on ironclad vessels—a problem made patent at the time the *Monitor* and *Merrimac* battled; the geological investigations of the Panama Canal slides by a committee of the Academy on whose findings were based the methods of control adopted; the many problems of the World War days and in more recent and peaceful times the host of problems presented to the Science Advisory Board and the National Research Council.

The National Research Council, just mentioned, is a permanent operating agency of the Academy designed to broaden the base of its service to the nation. It originated in the vast complexities of major scientific problems of the war and post-war days. It was established by the Academy at the request of President Wilson and was made a permanent part of the Academy set-up in response to an executive order which he issued.

The Academy and Council together constitute an organization which is at all times and at short notice in position to bring to bear on any problems in the field of science the best talent that the nation has.

In addition to its advisory functions the Academy as a whole holds two meetings a year for the presentation of scientific papers and the conduct of its corporate affairs. The annual meeting at the Academy building in Washington each spring is also the time when new members are elected. The fall meeting is held at some scientific center, where brief summaries of the latest accomplishments in science are presented.

So much by way of explaining what the Academy is and how it came to be. Now a few words in a quite different vein but one which, it seems to me, is proper in a person of my antecedents.

In electing an applied scientist and engineer to its presidency, the Academy broke with the traditions of the past. Why, I do not know, unless it was because of a feeling that experience in the art of application might be helpful at this time in assisting the Academy to discharge its obligations as scientific adviser to the Government. Possibly my views on many matters concerned with science and its applications are not traditional ones, and in these concluding remarks I lay no claim to any considerable wisdom.

It is an old adage which counsels the shoemaker to stick to his last. In what I shall say to-night, I propose to take this maxim very much to heart. The American scene unfortunately suggests from time to time that this sage advice may have fallen into disrepute in certain quarters. If so, I suspect it is because of our own short-sightedness and not because of any obsoleteness in the adage. It is usually not a pleasant spectacle to behold a person who, having attained eminence in one field, casts a shadow across his own reputation by assuming to exhort his fellows in spheres of actions in which he has had no experience. It reminds me of a subtle combination of wit and wisdom which Sir Richard Gregory introduced me to while he was making his recent visit to this country. As I recall it, he said that a member of Parliament admonished the House one day that it was always a good plan to have an expert on *tap* but never on *top*.

Now, I am a specialist, an expert if you please—a fact for which I make no apology—and it is as such that I wish to stand before you to-day; *viz.*, one who is on *tap* but not on *top*.

As to my specialty, there is a great deal that could be said on such an occasion and at such a time as this. We live and, what is perhaps even more important,

we *fight* in the midst of applied science, and with the tools and weapons which applied science has given us. This is certainly not the *fault* of science; neither does the responsibility for correcting the situation lie solely at the door of science. It is a problem as broad as society itself, and while the scientist very assuredly ought to have helpful suggestions which he can offer, he ought for his own sake to be cautious in delivering himself of panaceas. Perhaps our position is somewhat analogous to that of the chemist who synthesizes a new narcotic—he stands ready to advise regarding its making and its properties but leaves the matter of control in the hands of society through its appointed agents. To push the analogy farther than this would, I am afraid, be to risk the danger of overworking it. The narcotic problem is absurdly simple compared to that involved in the wise assimilation of science; more particularly the beneficent uses of the narcotic may be vanishingly small compared to its potentialities for harm, whereas we hope—perhaps we are incorrigible optimists in such hoping—that the contrary is true of science.

It is quite apparent that the administration of science has two very distinct aspects—one the national, the other the international—and that no competent agencies exist for dealing with either. This situation would on the whole appear to be a fortunate one. Certainly nothing could be more inimical with respect to future progress than an over-developed administrative agency which is insufficiently guided by wisdom, experience and accurate analysis of the problems to be met. Fortunately the affair is still largely fluid and such attempts at crystallization as have been made have as yet had little effect. But let us not drop into a state of indifference as a result of this. While we need scarcely fear that we are confronted at the moment with a condition of supersaturation or of supercooling, we must not forget that the National Academy bears a double responsibility. It is at the same time spokesman for the sciences collectively and the chief scientific adviser to the government. This, in itself, makes our position one calling for careful study. In the words of Pooh-Bah, the Lord High Everything Else, we may, as official representative of American science, declare in favor of untrammeled liberty for fundamental and applied research; or we may, as Lord High Councilor on Science to a Government which for a complex assembly of reasons and motives is drifting in the direction of socialization, make suggestions which might urge on the present drift.

Now, when I say that *we may* do these things, do not misunderstand me. I do not wish to imply that we ought to feel a special urge to do them now or even within perhaps the coming decade, nor do I mean to imply that we will so soon as this be asked for our advice upon this exceedingly complex matter. My thought is one solely of preparedness. There is abundant evidence that for a considerable period of time the tide has been drifting in the direction of increased intermeshing of social forces and increased centralization of control, and that the causes for the tide appear such as to suggest that as yet we have by no means reached the high-water mark. If this hypothesis is true—or, better, if it is not definitely known to be untrue—then I suggest that it is incumbent upon us, both because we are scientists and as such are eager to preserve the liberties of science, and because we are chief scientific adviser to the Federal Government and, therefore, in duty bound to give unprejudiced advice to this agency of the people as a whole, to give heed to the tide. In some way we must merge our collective talents so that to whatever extent is humanly possible, we will arrive at a long-range broad-visioned forecast of the sociological significance of our specialities when taken collectively and when integrated—as is steadily being done—into the fabric of our daily lives.

Let me caution again that I do not visualize this task as one which we can assume at a given moment and conclude at an equally definite but later moment. It is one with which, as I see it, we must be reconciled to living through the years to come. The objective of the present day will have been achieved if we accept the reality of the problem and regard it as one demanding conscious analysis and constructive thought to a degree greater than we as a body have accorded it in the past.

In conclusion, I return again to the adage of the shoemaker. We are all specialists and each must stick to his last. At the same time, as an Academy we are a single, although composite, expert, and as such we should be in possession of faculties at least as comprehensive as are anywhere else attainable. The future, even more than the present, promises to require cooperative effort—and in this problem, which we might denote as the socialization of science, we meet in transcendent form a challenge to our collective talents.

FRANK B. JEWETT

ABSTRACTS OF PAPERS

The sensory cortex of the chimpanzee's brain: J. G. DUSSER DE BARENNE (introduced by W. R. Miles). Local strychninization, *i.e.*, strychninization of a few square millimeters, of the sensory cortex of an anesthetized animal results in typical changes of the electrical activity of this cortex, *i.e.*, the appearance of large and rapid voltage fluctuations, *strychnine-spikes*, in its electrocorticogram. These spikes not only appear in the electrogram taken at the site of strychninization but also in the electrograms from areas functionally related to the strychninized area. In this way it is possible to delimit the sensory cortex in the anesthetized animal. Thus, in collaboration with Dr. W. S. McCulloch, the location and extent of the chimpanzee's sensory cortex was determined. It proved to be a very large region, located both in front and behind the