SCIENCE

VOL. 79 FRIDAY, MAY 4, 1934 NO. 2053

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. MCKEEN CATTELL and published every Friday by

THE SCIENCE PRESS

New York City: Grand Central Terminal
Lancaster, Pa. Garrison, N. Y.
Annual Subscription, $6.00 Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary, in the Smithsonian Institution Building, Washington, D. C.

ADDRESS OF THE PRESIDENT OF THE NATIONAL ACADEMY OF SCIENCES[1]

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THE committee on the program for the meeting of the academy has requested me to continue this evening the series of president's addresses inaugurated two years ago. This I gladly do, as there are several matters which could wisely be spoken of on this occasion; but the need for brevity on my part is made clear by the fact that several medals and prizes are to be awarded after the close of this address.

At our dinner of last year I spoke at length, and I hope with some evidence of deep feeling, about the threatened reduction of financial support for research activities in all our universities, research institutions, learned societies and the research bureaus of the United States Government, and about the resulting state of anxiety on that subject then existing with the members of the faculties and staffs of those organizations. The threatened reductions were made, by essentially all the organizations referred to, and in most cases upon a heroic scale. Clearly there is no need for me to speak again, or at this time, concerning adequate support for research in the domain of the sciences by our government, as the many paragraphs on that subject in my address of one year ago were published in the journal SCIENCE, through the courtesy of Editor Cattell, and for the further reason that in the twelve intervening months the evidences of interest in scientific research within the borders of our country, and likewise in the question of international

[1] Given after the dinner at the annual meeting of the academy, April 24.

cooperation in research, have been plainly visible in many high governmental places; but I doubt whether the dread fears of yet greater reductions of research support in the universities, more especially in the state universities, and in many other research institutions, have been allayed. Notwithstanding the heavy subtractions from research support, the output of scientific development and discovery has continued to be fine in quality and surprisingly large in quantity, but the time has not yet come when we can estimate the full consequences of the reductions. If the support should continue upon the reduced scale through two or three additional years, extremely unfortunate effects could scarcely be avoided. Especially do we view with regret the inability of many instructors, research assistants, and recent recipients of the doctor of philosophy degree to do those things which they had enthusiastically and successfully prepared themselves to do, at the cost of much time, money and energy. A few years of temporizing with odd jobs to secure a living for themselves and their dependents will go far in breaking their scholarly spirit and their high ambitions, and take them permanently out of the research field, with great resulting harm, not only to themselves, but to the public welfare. These sympathetic and anxious views I express after making due allowance for the conditions, well known to our members, that too many unworthy students are permitted to go through our colleges, that too many doctorate degrees are conferred by our universities, and that some activities labeled research are not entitled to bear that name.

I am not called upon to declare here, of all places in the United States, and especially before this audience, the importance of research, the incomparable values of its accomplishments, the need for its continuance in strength diminished in no greater degree than is unavoidable and essential to the public weal. I venture to say you will join me in expressing the opinion that the products of research in the domain of the physical and biological sciences, including the medical sciences, have been more potent in advancing the state of civilization on the earth from its low level of the fifteenth and earlier centuries to its at least decidedly higher level in the twentieth century than have all other forces combined. I do not question the thesis that many forces of non-scientific character, both idealistic and practical, have been exceedingly influential and powerful in behalf of the nations and their peoples, but in the main those forces would not have existed, or certainly could not have operated, if the sciences had not provided the mental and moral attitudes, the open sesame that permitted those forces to go out into the great world and exert their effective and beneficient influences.

In his Henry VI Shakespeare says, "Ill blows the wind that profits nobody." In Henry IV and possibly elsewhere he repeats the sentiment. Quite likely Shakespeare found it in the writings of earlier authors or observed it to be in current use. This sentiment has lived through the centuries, because it represents human experience. I hope you will not regard me as unsympathetic when I predict that some good, some profit, will come out of the lamentable economic winds of the past four years. The sufferings of many millions of our people, now receiving the profound consideration of our governments and of our fellow citizens, as to corrective measures for the present, and preventive measures for the future, will, I hope, be short-term sufferings; the benefits will, I believe, be long-term benefits. The stupendous bills we have been paying for our various acts of foolishness in financial and other fields may be regarded, in my humble opinion, as educational bills; and the costs of educating a nation are always high.

Going back in time no further than 1921, it has been as if the idealism with which we did our part in the war had changed, with startling rapidity, to precisely the opposite quality—materialism; as if we had "fallen ill of a fever"—the fever of speculation; the fever of greed; the fever that too frequently urged the getting of material things, especially money, in return for little or no real service. If, as the sequel, we are persuaded to stop and consider what things are worth living for, and to reach the conclusion which clearly accords with the truth—namely, that the real progress of the world depends upon ideals and idealistic possessions and not upon material things—the immense cost and waste will in some measure have been balanced.

Amongst the many good things already brought by the recent winds of adversity which should be of special interest to us, because of the dependence of research, in the long run, upon the standards prevailing in the colleges and universities, are, in my opinion, the following:

(1) The wider recognition of the principle that, as the laws of our nation and of the several states do not require even one young man, or any young man, to go to college, every college student should assume the duty and responsibility of deciding for himself whether or not he is going to study seriously the subjects of his choice, without any prodding or coddling by his institution, and abide by the consequences. We hear it said on the college campuses that the development of character in the students is a more important objective than the development of scholarly ambition. I am not disposed to quarrel with that thesis; in fact, I accept it; but I have yet to be convinced that a strong and worth-while type of character will in any

degree whatsoever result from putting unambitious students through college by either the prodding or the coddling process. Personal responsibility, assumed and discharged, is the greatest of all teachers and the best developer of character. The chill economic winds of the past four years have, indirectly, in my opinion, already raised the level of scholarship in our colleges, with additions to, rather than subtractions from, the personal-character yield.

(2) A realization by our college and university students that in the filling of a position offering fine opportunities for the higher teaching, or for research, we have now for the first time reached the condition of very real competition of many applicants for the position, and that in strong measure this condition is likely to remain with us indefinitely. Competition makes for greater effort and better results, and its persuasive effects upon young men in universities now preparing for high places are said to be apparent.

(3) A growing realization by our thoughtful citizens and over-burdened taxpayers that there is pressing need for greater utilization of scientific advice and scientific planning in the governmental affairs of the nation, the states, the counties and the municipalities, as evidenced by the calling upon many professors and investigators in the several sciences in various parts of the nation for guidance and assistance.

Members of the academy, we can not be reminded too frequently of the academy's mode of origin and of the academy's one purpose, as expressed by its founders. At a time of great national stress and strain, in the middle year of the Civil War, 1863, the Congress of the United States, desiring to have a definite organization of men learned and experienced in the physical and biological sciences to which it could go for knowledge and advice on scientific subjects, gave charter to such an organization, through the adoption of an *Act to Incorporate the National Academy of Sciences,* and to said act President Lincoln attached his signature in approval. The one and only purpose of the academy in the eyes of the Congress was that it should be the adviser of the government in scientific matters, as expressed in the charter, thus: ". . . the Academy shall, whenever called upon by any Department of the Government, investigate, examine, experiment, and report upon any subject in science or art [meaning not the esthetic arts, but the practical arts] . . . , but the Academy shall receive no compensation whatever for any services to the Government of the United States."

When an American citizen, necessarily a contributor to knowledge, accepts election to membership in the academy, he tacitly agrees to heed every such summons, and to serve his government to the best of his ability, in the manner described, without expectation of receiving compensation. In the seventy-one years of its life, the academy has responded many times to the government's call, on the terms prescribed in the charter, and gladly.

In this connection you will be interested in a quotation from the splendid annual address delivered by the distinguished President of the Royal Society, Sir William Huggins, at the society's anniversary meeting, in 1904: "During the last few years a very large amount . . . of work outside the reading, discussion, and printing of papers . . . has been thrown upon the Royal Society. . . . . . mainly it has consisted of assistance freely given, at their request, to different Departments of the Government on questions which require expert scientific knowledge, and which involve no small amount of labor of the officers and staff, and much free sacrifice of time and energy from Fellows, ..."

The charter condition, "that the Academy shall receive no compensation whatever for any services to the Government of the United States," exemplifies the correct and only wise policy. The academy, in providing knowledge and in giving advice, must be wholly disinterested, in the financial or material sense. The academy is interested in the truth, in its origins and causes and, especially when giving advice, in the consequences of the truth; and it must not compromise with expediency.

The comments of the president of the Royal Society, Sir William Huggins, in the same annual address, upon this item of policy, are very interesting. The Royal Society "asks for no endowment from the State, for it could not tolerate the control from without which follows the acceptance of public money, nor permit of that interference with its internal affairs which . . . is associated with State endowment." Again, from the same address, ". . . the Royal Society . . . has been regarded by the Government as the acknowledged national scientific body, whose advice is of the highest authority on all scientific questions, and the more to be trusted on account of the Society's financial independence"; and, quoting further, "The financial independence of the Royal Society, neither receiving nor wishing to accept State aid for its own private purpose, has enabled the Society to give advice and assistance which, both with the Government and with Parliament, have the weight and finality of a wholly disinterested opinion."

This beautiful and interesting building, the home of the academy, was completed and occupied just ten years ago. Previously, and during the first sixty-one years of its life, the academy had no home it could call its own. Administrative headquarters and rooms and other facilities for the successive April meetings

were most generously made available by the secretary and regents of the Smithsonian Institution. The long delay in securing an abiding place had one valued advantage: the legal title to this building and to its grounds rests with the National Academy of Sciences: the land was provided by gifts to the academy made by many public-spirited citizens; and the building, and an endowment fund to cover the costs of the building's maintenance and administration for the use of the National Academy of Sciences and the National Research Council, were the exceedingly generous gift of the Carnegie Corporation.

There are some unfortunate consequences of the long delay in finding a permanent home. Ever since 1863, countless publications on scientific subjects have been coming to the academy, by gift and exchange. There are many tens of thousands of books, pamphlets, journals, et cetera, in the large basement room that was planned and constructed to receive book shelves, and there are the Library Room (where we met before dinner), fitted to receive six or seven thousand volumes most in demand, and the beautiful Reading Room to the west of the Library Room; but until two days ago there had been no positive and material action taken to provide a working library, or even an orderly arrangement of the books. A little over a year ago I appointed a committee to study and consider our library problem, and to formulate a definite library policy, under the able chairmanship of Dr. David White, for recommendation to the academy's council; and some very desirable decisions concerning a library policy have this week been made.

Secondly, the walls of our rooms are in the main bare and monotonous. We have no portraits, busts, tablets or other works of art in commemoration of our deceased members. Those of us who have been privileged to visit the rooms of the Royal Society, of the colleges in Oxford and Cambridge, and of similar institutions in Great Britain and on the European continent, know how vitally such memorials contribute to the attractiveness and the spiritual effectiveness of those institutions. In recent months the council of the academy has considered this subject, in relation to the academy's rooms, and a committee is in process of appointment, with duty to formulate a policy for submission to the council.

The academy has been exceedingly fortunate, uniquely fortunate, in view of its comparative youth, in its receipt of gifts and bequests to serve as foundations for the awarding of medals and prizes of money, and the making of grants in aid of research. We have nine medal funds, not counting the Barnard Gold Medal [for which a committee of the academy selects the recipient for recommendation to Columbia University in New York, the university making the actual award once in five years, in recognition of meritorious services to science]. Six of the academy's medals and likewise the Barnard Medal bear the honored names of deceased academy members; and eight foundations providing grants for aid in research projects also bear the names of deceased members. For these valued provisions the academy is deeply grateful. The awards and grants are made in recognition of noteworthy accomplishments in research, and for the encouragement of research activity and discovery in the future. More briefly they are to be interpreted as honors conferred by the National Academy of Sciences upon their receipients, but in this connection I should like to repeat a statement in my address of two years ago: the academy's ability to confer honor upon its members and others of high achievement proceeds from the honors conferred upon the academy by its members through their accomplishments in the advancement of knowledge.

In the current academic year the academy is awarding five medals and four honoraria. The first of these awards, the Comstock Prize in money, was formally presented to Professor Percy Williams Bridgman, of Harvard University, at the meeting of last November in Cambridge. You may be interested to know that the amount recorded on the certified check drawn to Professor Bridgman's order was $2,500.00.

There are five medals and three prizes to be presented this evening. The need for short presentation addresses and short responses is apparent.

The Committee on the Marcellus Hartley Gold Medal, for eminence in the application of science to the public welfare, has recommended that the medal for 1934 be awarded to Dr. David Fairchild, from 1889 until his retirement two or three years ago an invaluable member and officer of the scientific staff of the Department of Agriculture, and the academy has formally confirmed the recommendation. To our extreme regret the eminent recipient of the award, Dr. Fairchild, is in a state of ill health that requires him to live in Florida during the winter and early spring months, and his desire to be with us and receive the medal in person has been denied by his physician. The medal will be received by Dr. Fairchild's representative for the occasion, Mr. Knowles A. Ryerson, chief of the Bureau of Plant Industry in the Department of Agriculture, who will respond in Dr. Fairchild's name. Chairman Gano Dunn of the committee has likewise been prevented by illness of several months' duration from making the presentation address, but his colleague on the committee, Dr. H. H. Donaldson, member of the Wistar Institute of Anatomy and Biology, will state the reasons that governed the choice of Dr. Fairchild for the award.

There are two Daniel Giraud Elliot Medals and Honoraria to be presented this evening, for most meritorious work in zoology or paleontology pub-

lished each year. The condition fixed by the donor, "published each year," has had the practical effect of delaying the successive awards.

The Committee on the Daniel Giraud Elliot Fund has recommended that the Gold Medal and the Honorarium for the year 1930 be awarded to Professor George Ellett Coghill, member of the Wistar Institute of Anatomy and Biology, and the academy has been pleased to confirm the recommendation. We are grateful for the presence of Professor Coghill and Mrs. Coghill as the guests of the academy. Dr. Ross G. Harrison, Sterling professor of biology in Yale University, chairman of the academy's committee, will state the reasons that governed the committee's selection of Professor Coghill.

The second of the two awards, that for the year 1931, carries with it a note of sadness. Last autumn the Committee on the Daniel Giraud Elliot Medal and Honorarium recommended that the award for 1931 be made to Dr. Davidson Black, a citizen of Canada, fellow of the Royal Society, fellow of the Royal Society of Canada, and professor in the Peiping Union Medical School, Peiping, China; and to the committee's recommendation the academy was pleased to give its approval. I regret exceedingly to say that six weeks ago occurred in Peiping the lamented and untimely death of Dr. Black. Fortunately, Professor Black last November received the academy's official notification of the award and the academy's invitation to be with us this evening. He responded in appreciation of the honor done him, but said, with regret, that the great distance would prevent him from coming. It is in accordance with the academy's custom that the award be made posthumously. The address in recital of the reasons leading to the choice of Professor Black will be made by Professor Henry Fairfield Osborn, a member of the committee. Through the kind offices of the Envoy and Minister of Canada, I sought for the name and address of a near family relation of the late Dr. Black who could attend our dinner as the academy's guest and receive the Medal and Honorarium, but this proved to be not practicable. We are fortunate that our esteemed foreign associate, Professor Frank Dawson Adams, of McGill University, Montreal, fellow of the Royal Society and fellow of the Royal Society of Canada, is here to serve as Mrs. Black's representative. Professor Osborn will speak of the late Professor Black's splendid credentials.

Another distinguished foreign associate of the National Academy of Sciences, Sir Arthur Stanley Eddington, of Cambridge University, who is lecturing for a time in Cornell University, is with us to-day, not only in response to my invitation, but in his own constitutional right, as the guest of the academy. He contributed a valued paper to this evening's program, and he is honoring my request that he speak this evening. I do not know the title of his address, but that is no cause for regret, for there lives no devotee of the physical sciences who is more able and successful in making clear his thoughts on any subject of which he speaks or writes. I take unusual pleasure in the privilege of introducing Sir Arthur Stanley Eddington, fellow of the Royal Society, fellow of Trinity College and Plumian professor of astronomy in the University of Cambridge.

We have the valued privilege of making this year the first award and presentation of the Charles Doolittle Walcott Medal and Honorarium. The financial foundation upon which the awards are to be made, once in five years, was generously provided by Mrs. Charles Doolittle Walcott, in memory and honor of her distinguished husband, the late Charles Doolittle Walcott. "The purpose of the fund is to encourage and reward individual achievement in advancing our knowledge of pre-Cambrian life and its history in any part of the world." Dr. Walcott, very able president of the National Academy of Sciences in the years 1917 to 1923, will be remembered also as the splendidly successful director of the U. S. Geological Survey through the years 1894–1907, and secretary of the Smithsonian Institution during twenty years and until the close of his life in 1927, and as a front-rank student of geology and paleontology. Unfortunately, the passing of time prevents me from saying more, except that Mrs. Walcott is with us this evening as the very welcome guest of the academy. The committee on the Charles Doolittle Walcott Medal and Honorarium [$1,350.00], of which Dr. Charles Schuchert, professor emeritus of paleontology in Yale University, is the chairman, has recommended that the first award be made to our likable and wholly admirable fellow member, Dr. David White. Professor Schuchert will state the reasons governing the committee's choice and the academy's decision.

The Agassiz Medal Foundation is an especially interesting one. It was established by gift of the late Sir John Murray, one of the most eminent oceanographers of the British Empire and of the world, in honor of Alexander Agassiz, president of the National Academy of Sciences in the years 1901 to 1907, who, during his lifetime, was a most active and successful student of oceanography and a very liberal patron of oceanographic research. The committee on the medal, of which Professor H. B. Bigelow, director of the Woods Hole Oceanographic Institution, is chairman, has recommended that the medal be awarded to Dr. Björn Helland-Hansen, member of the staff of the Oceanographic Institute at Bergen, Norway; and to this recommendation the academy has gladly given its approval. Dr. Helland-Hansen has found himself unable, by virtue of dis-

tance, and to his extreme regret, to be with us, but we are honored in the presence of the esteemed Envoy and Minister of Norway, in Washington, and Madame Bachke, as the guests of the academy. The minister has graciously consented to serve as the representative of his distinguished countryman, the Agassiz Medalist for the year 1934. I shall ask Professor Bigelow to set forth the reasons governing the award.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

PRELIMINARY ANNOUNCEMENT OF THE BERKELEY MEETING

Edited by Dr. HENRY B. WARD
PERMANENT SECRETARY

THE ninety-fourth meeting of the association will be held in Berkeley, Calif., from June 18 to 23, 1934. This will be the fourth summer meeting of the association on the Pacific Coast, previous meetings having been held at San Francisco in 1915, at Portland, Oregon, in 1925 and at Pasadena in 1931. All these have been joint meetings with the Pacific Division. This year the University of California and the Pacific Division of the association are cooperating as hosts. Sessions will be held for the most part in lecture halls of the University of California on the campus at Berkeley. As has been found desirable in summer meetings, symposia and invited programs are emphasized and field trips are numerous.

The fine program secured by the efforts of the Pacific Division and the local committee, the attractive environment of the region and the preliminary correspondence regarding attendance all indicate a most successful meeting. It is hoped that a representative attendance from the membership in other sections of the country will take advantage of this opportunity.

LOCAL COMMITTEE, OFFICERS OF SECTIONS AND COOPERATING ORGANIZATIONS

The general chairman of the local committee is Roy Elwood Clausen, professor of genetics at the University of California; the general secretary is Alva Raymond Davis, professor of plant physiology at the University of California; and the treasurer is L. A. Nichols. More than fifty others have been working with these officers as members of subcommittees to provide in various ways for the convenience and comfort of visitors and to make the occasion a conspicuous success. The following sections with the officers indicated have arranged the particular programs and the facilities for the meetings of the sections and the associated societies meeting in Berkeley at this time.

In Mathematics Professor E. R. Hedrick is secretary and Professor T. M. Putnam local representative. The American Mathematical Society is to meet with this section. In Physics Professor L. B. Loeb is secretary *pro tem* and local representative. The American Physical Society and the American Meteorological Society are meeting with the physicists. In Chemistry the secretary *pro tem* and local representative is Professor G. K. Rollefson. The Pacific Intersectional Division of the American Chemical Society joins with the section. In Astronomy Professor C. D. Shane is secretary *pro tem* and local representative. The Astronomical Society of the Pacific is to meet with this section.

In the Zoological Sciences the secretary *pro tem* and local representative is Professor S. F. Light. The Western Society of Naturalists, the Western Division of the American Society of Ichthyologists and Herpetologists, the Pacific Coast Branch of the American Association of Economic Entomologists, the Entomological Society of America and the San Francisco Aquarium Society will meet with the zoologists. In the Botanical Sciences Professor R. M. Holman is secretary *pro tem* and local representative. The Botanical Society of America, the American Phytopathological Society and the American Society of Plant Physiologists are meeting with the botanists. The Genetics Society of America and the Ecological Society of America will also meet with the zoologists and botanists. In Anthropology the secretary is Professor W. M. Krogman and the local representative is Professor A. L. Kroeber. The American Anthropological Association is to meet with this section. In Psychology Professor J. A. McGeoch is secretary and Professor Warner Brown is local representative. The Western Psychological Association joins with the section.

In the Social and Economic Sciences Professor Robert D. Calkins, University of California, has been appointed secretary *pro tem* and is taking charge of the program; the contributing organizations are the Econometric Society, represented by Professor J. B. Canning, the San Francisco Chapter of the American Statistical Association, represented by Professor B. F. Haley, and the Social Science Research Confer-