NATIONAL ACADEMIES AND THE PROGRESS OF RESEARCH. II

USES OF AN ACADEMY BUILDING

In addition to experimental and illustrated lectures, the Academy might advantageously maintain exhibits freely open to the public, showing the current researches of its members, the most recent European advances in science, and new applications of scientific methods in the industries. It goes without saying that ample space and the best of facilities would be required for this purpose. If carefully worked out, this plan should provide an additional means of keeping the public informed of the progress of research and its bearing on the industries of the country. While emphasis should always be laid in such exhibits on pure science, which it is the Academy's prime object to advance, some of the most striking illustrations of the applications of science should also be introduced.

It is obvious that the Academy can not undertake such activities unless it can obtain a large building of its own. The advantages of having such a building for other purposes have already been touched upon. The attractiveness of the annual meetings would be greatly enhanced if they were held in such surroundings as an Academy building could supply. There is a very real difference between the atmosphere of bare halls, casually occupied, and attractively furnished rooms, permanently belonging to the Academy, and charged with the stimulating traditions accumulated during the process of time. The walls should be hung with portraits of past presidents and other eminent men of science, which could easily be obtained if there were a place for them. Moreover, the example of the Royal Society in preserving Newton's telescope and of the Royal Institution in exhibiting the original instruments of Davy, Faraday and other great investigators, should be followed as soon as possible by the National Academy. Doubtless it is still feasible to secure instruments used by Joseph Henry, the two Agassizs, and others who have played a similar part in the history of the Academy. A permanent committee, charged with the collection of portraits, manuscripts, and instruments, and exercising care and discrimination in its selections, would gradually bring together many objects which would become more and more valuable with the passage of time.[18]

HISTORICAL EXHIBITS

[Few writers on civilization in America appreciate how largely the United States has contributed to the development of certain fields of research. The mathematical memoirs of Gibbs were of fundamental importance, while in such fields as celestial mechanics, practical astronomy, astrophysics, experimental physics, geology and paleontology, and in many of the newer phases of biology and experimental medicine, National Academy members have led the way in a long series of advances. An exhibit of original instruments, manuscripts, and photographs, arranged so as to show the successive contributions of American investigators in various departments of research, would prove an inspiration to many a young and enthusiastic aspirant to the pleasures of original discovery. I shall never forget my own delight in first seeing some of Henry Draper's original negatives of stellar spectra. Many of these are now in the possession of the Academy, ready for use in an exhibit of continuous progress in astronomical spectroscopy covering the

[18] [A committee of this kind, which was appointed in November, 1913, has already received from Mrs. Henry Draper valuable instruments and original negatives illustrating the pioneer researches in astrophysics of the late Henry Draper.]

whole history of the Academy: Rutherfurd's first successful diffraction gratings and large-scale photographs of the solar spectrum; Draper's spectra of stars and planets, the first to show the lines; Young's pioneer observations of the spectra of sunspots and the chromosphere; Langley's bolometric investigations in the invisible region of the infra-red, and his measures of the solar constant of radiation; Pickering's extensive discoveries and classification of stellar spectra photographed with the objective prism; Rowland's invention of the concave grating, and his fundamental studies of solar and laboratory spectra; Michelson's ingenious and varied contributions to the instruments of spectroscopy, comprising the interferometer, echelon and large grating, and his researches with them; Keeler's studies of celestial spectra, inaugurating the era of accurate radial velocity measurements; Campbell's perfection of the stellar spectrograph and the far-reaching results of his years of observation. Each of these American investigators marked a distinct epoch in astrophysical research, and their labors form a continuous chain covering the entire life of their subject. It is still possible to obtain many of their original instruments and earliest photographs, and to exhibit them in an attractive manner. Who would not like to see an actual spectrum formed by Rowland's earliest grating? A touch of a button operating an arc light mounted before the spectroscope slit, is all that would be necessary. And if this can be done in one field of research, there is no reason why similar stimulus can not be given in others, though of course in varying degree. If many subjects can show any such series of advances as we have seen in astronomical spectroscopy, the pessimism shown by some writers regarding American research must surely give way to optimism. And no method of bringing the true state of affairs to easy comprehension, both to men of science and to the public, could equal that of the proposed exhibit. It goes without saying that the ingenious and attractive devices of modern museums should be employed, instead of the dry and forbidding exhibition methods of former times.]

The committee on historical apparatus might also have charge of instruments belonging to the various trust funds and no longer in use by the persons to whom the original grants for their purchase were made. In the course of time such a collection would naturally grow to considerable proportions, and the Academy would be enabled to assist its members by the loan of these instruments, as the Royal Society has done so effectively. The objection which is sometimes made to the purchase of standard instruments by the recipients of grants would thus be removed, as such instruments might prove of great service in a collection for general use.

TENTATIVE DESIGN OF AN ACADEMY BUILDING

[The design of an Academy building here reproduced[19] is intended merely as a

[19] [From preliminary sketches by the firm of Shepley, Rutan and Coolidge. Some of the designations of rooms here employed should be modified. The name "conversazione room" for the large public hall comes from the annual conversaziones of the Royal Society, where many instruments and experimental exhibits are shown. The photographic room (not needed on this floor) should be used for council meetings, setting free the room allotted in the plan to the council for a members' ante-room, adjoining the meeting room. The meeting, lecture and exhibition halls are shown in Fig. 2 as extending up through the second floor, but the laboratories and other parts of the building would be divided into several stories of ordinary height. The laboratories may of course be devoted to any desired field of research, and the designations are merely intended to suggest that one of these be in the physical and the other in the biological sciences.]

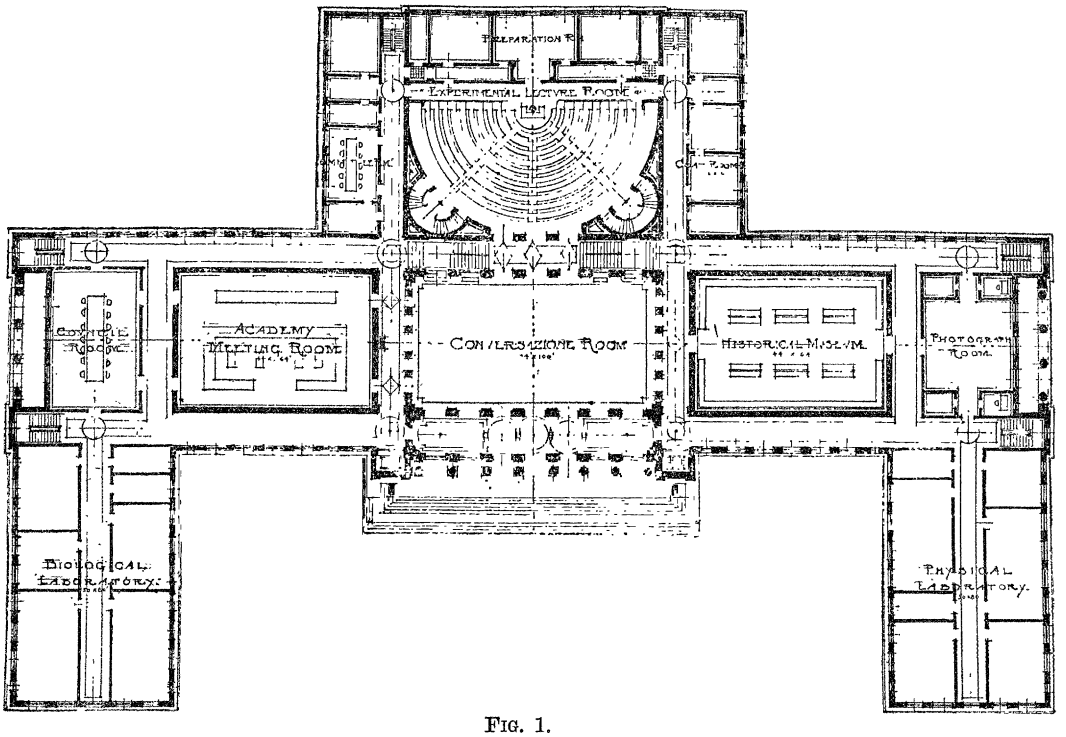
PREPARATION
EXPERIMENTAL LECTURE ROOM
ACADEMY MEETING ROOM
CONVERSAZIONE ROOM
HISTORICAL MUSEUM
PHOTOGRAPH ROOM
BIOLOGICAL LABORATORY
PHYSICAL LABORATORY

FIG. 1.

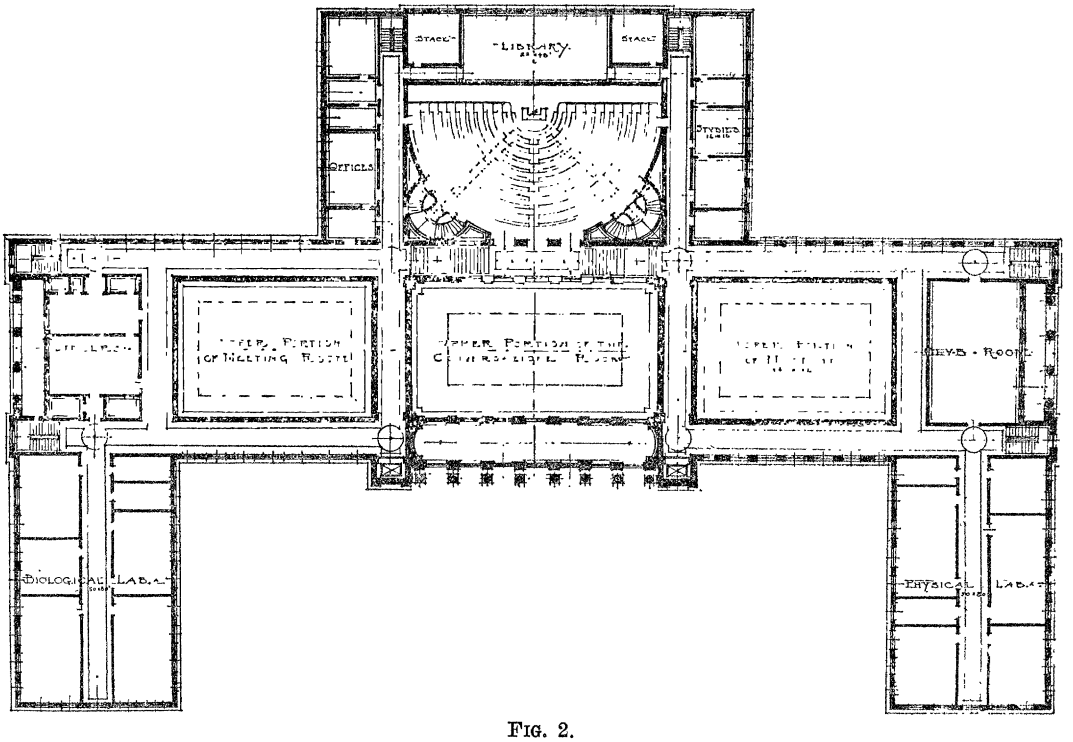
STACK
LIBRARY
STACK
OFFICES
STUDIES
PHYSICAL LABS

FIG. 2.

basis for discussion. The large public hall into which the main entrance leads is for the proposed exhibit of current research, illustrating the latest advances in pure and applied science, both American and foreign. The public would undoubtedly appreciate an opportunity to see under microscopes the most recently discovered bacilli, and to examine specimens illustrating the experimental variation of plants or animals, photographs showing new astronomical discoveries, experimental demonstrations of physical phenomena like the recently found Stark effect (the influence of an electric field on radiation), the structure of crystals, X-ray spectra and their bearing on the constitution of the atom, etc. As the home of such an exhibit, and the place of publication of the *Proceedings,* announcing the current advances of American research, the Academy would soon be recognized in its true character as the natural center and promoter of the scientific work of the United States.

In the adjoining room to the right the exhibit of historical research would connect the present with the past, and give a clear picture of American progress in the field of science. The possibilities of this exhibit have already been mentioned, but it may be remarked here that one of its prime purposes should be to stimulate further investigation and to aid in the Academy's work of correlating science by indicating converging lines of research. Both of these objects are of course perfectly compatible with the initial idea of commemorating the labors of Academy members.

The lecture hall at the rear of the building completes the group of rooms open to the public. This should embody some of the features which make the lecture hall of the Royal Institution so attractive. The provision of ample facilities for experimental demonstrations (including a well-equipped preparation room) which no large lecture hall in Washington contains at present, would add greatly to the means of interesting both men of science and the public.

To the left of the central hall is the Academy meeting room, which might advantageously combine various features found in European academies. One of the most attractive meeting rooms abroad is that of the Paris Academy of Sciences. The provision of a comfortable ante-room,[20] equipped like a club and providing abundant opportunity for conversation among members, would be a valuable addition. Instead of admitting visitors to the meeting-room they could be better accommodated in a second floor gallery, above the ante-room, similar to the visitors' gallery of the Amsterdam Academy. Finally, a modified seating arrangement (probably retaining the tables for officers and members) would permit the inclusion of a screen and experiment table at one end of the room.

The main floor would also contain a council room,[21] and various offices, cloak rooms, serving rooms, apparatus rooms, etc., needed for use in connection with meetings, lectures, exhibits, public receptions and other functions. The offices of the secretaries, editorial rooms, library and reading rooms, private research rooms and other rooms not for public purposes would be on the floors above. The example of the Berlin Academy,[22] which provides numerous offices (45 in all) in its new building for the compilation of data required for a general catalogue of stars, bodies of

[20] In the space here marked "Council Room."

[21] In the space here marked "Photograph Room."

[22] See "The Work of European Academies," SCIENCE, November 14, 1913, p. 692.

Greek and Latin inscriptions, a great Egyptian dictionary, and other similar undertakings, might well be imitated here. For instance, it would have been of great advantage to the Academy if it had been able to furnish Professor Newcomb with offices for the computers employed in his extensive astronomical researches, during the active period which followed his retirement from the Nautical Almanac office. Small study rooms for members staying in Washington, engaged in writing or research involving the use of the Academy library, would also be useful.

The two wings shown to the right and left of the main building are intended for research laboratories. While the great majority of members seem to favor the inclusion of such laboratories in the Academy's scheme of development, there are a few who do not, and it is desirable to point out why they appear desirable. The Academy stands, first and foremost, for research, which it seeks to advance in every effective way. It may thus follow the example of various academies abroad, such as St. Petersburg, which carries on important researches in physics and other subjects; Stockholm, which has long provided in its own laboratories for the spectroscopic investigations of Hasselberg; and Berlin, which has produced the extensive investigations already enumerated. Nothing could do more to advance the Academy's influence on the progress of science than the production of important results from its own laboratories. But there is another and even stronger argument in favor of their establishment.

It has been well said by one who has studied the problems of the Academy, that the success of its future work must depend upon the discovery of men who are willing and able to devote the necessary time and energy to it. Two Academy members, in commenting on suggestions for a building, remark that not laboratories, but *men* are needed. Those who are familiar with the history of the Academy are aware of the great amount of unselfish effort which it owes to its officers and members. But the fact remains that a man's first allegiance is to the university or other institution which counts him on its staff. As long as he retains such connections he can devote only his spare time to the work of the Academy, which, nevertheless, demands his best efforts.

The provision of research laboratories, with funds for their maintenance, would enable the Academy to command the entire time and effort of some of the ablest men in the country. The growing work, which already throws heavier burdens than the members realize on the willing shoulders of the Home Secretary, may later demand (as in the Royal Society) the services of two men, one representing the mathematical and physical, the other the biological sciences. The only way to secure the undivided service of such men is to offer them adequate salaries, a suitable staff of assistants, and ample laboratory facilities. Thus, while carrying on their researches in the name of the Academy, they would be able to direct the extensive work which the exhibits of current and historical research, the publication of the *Proceedings* and other contemplated activities must involve. Their position would be much like that of Faraday at the Royal Institution, with added duties defined by the broader range of the Academy's field.

An important object of the proposed research laboratories, therefore, is to attract and hold the men whose unrestricted time and energy the Academy urgently needs. Volunteer service will continue and multiply, but it can never hope to accomplish all that the future will require.

No details of laboratory design need be discussed here. The use of the unit system of rooms, exemplified in the Harvard Medical School, would eliminate many difficulties, and facilitate alterations to meet changing needs. A common plant of refrigerating machinery, compression pumps, constant-temperature rooms and other requirements of both laboratories, could be placed on the ground floor of the main building, which would also contain rooms for storing reserve Academy publications and for other miscellaneous purposes.

Enough has been said to indicate some of the possible uses of an Academy building, and the corresponding necessities of the design. The present plan, which is merely tentative, may serve to bring out criticisms and suggestions from members, who will undoubtedly think of many advantageous modifications. A classic treatment is indicated, but this is mainly because of the prevailing conditions in Washington, and the probability that a government site could not be obtained for a building of collegiate Gothic design, for example.

It would be advantageous for the Academy to appoint a strong committee, representing all branches of science, to design a suitable building. Much time and thought are necessary to secure a satisfactory plan, which will provide for present needs, and be readily adaptable to future developments. As for funds, some time may be required to find the sum needed, but the opportunity is such an exceptional one that a willing donor is sure to appear in the future. The only way to obtain gifts for building or endowment is to have a scheme so promising, and plans so attractive as to convince a prospective investor that his funds will be effectively used. Notable cases might be cited where large gifts followed the presentation of effective building designs, which appealed not only to the eye, but equally to the judgment of the donor.]

TRUST FUNDS

The trust funds of the Academy, as shown in a previous article, have a total of over eighty thousand dollars, the income of which is exclusively devoted to research. In addition, there are other funds totaling over thirty-six thousand dollars, primarily intended for the endowment of medals and prizes, which enjoy a considerable surplus income also available for original investigation. By these means the Academy has been able to assist many of the most important researches of American science. A closer connection between the various committees, and the adoption of a concerted plan of action, would perhaps increase still further the usefulness of the funds. As a committee charged with the study of the use of trust funds has admirably expressed it:

> The Academy should take the initiative in the organization and conduct of research. It should not wait for applications or for suggestions to come in wholly from the outside. Such suggestions should be urged, but the Academy should not relegate itself to the function of a mere disbursing organization; it should seek rather to determine what projects are worthy of investigation and how the funds may be most judiciously administered.

Such a policy would seem to imply a careful examination on the part of each committee of the existing conditions and needs of research in its own field, and an endeavor, through cooperation with the other committees, to secure a well-balanced and thoroughly effective use of all Academy funds available for investigation. As already suggested, the gradual accumulation of instruments, returned on the completion of the work for which they were purchased, should ultimately result in a marked gain in the efficiency of the funds

and in the Academy's ability to assist investigators.

[As a body which is rapidly becoming truly representative of the investigators of America, the National Academy is well qualified to act in an advisory capacity to other institutions having funds available for use in research. It frequently happens that trustees of funds thus applicable require such expert advice as the Academy can give. A parallel case is that of the Royal Society, which selects annually the recipients of the Government Grant Fund of £4,000.

MEDALS AND PRIZES

In bestowing the Academy's gold medals for investigations in physics, astronomy, astrophysics, oceanography and the study of meteoric bodies, an attempt should be made, not only to recognize and reward successful investigators, but to do this in accordance with the best interests of future research. A few of the numerous medals awarded by academies, such as the Copley Medal of the Royal Society, may be advantageously reserved as a fitting recognition of many years of eminent service to science. But, as Diels[23] has justly remarked, the majority of medals and prizes will prove of greater value if given to comparatively young men, who still need support and encouragement. By acquaintance with the circumstances under which such men are working, an award may be made at a moment so favorable as to increase its value many fold. Thus recognition by the Academy may supply the precise argument needed to convince university authorities or others in control of research funds of the importance of providing the means necessary to continue and extend the work of the medallist. The same may be said of grants from trust funds. Cases are known in which a comparatively small grant has favorably influenced a board of trustees in deciding to devote large sums to research.

This leads to a consideration of the question of membership in the National Academy. In his valuable discussion of the organization of science, to which reference has already been made, Professor Diels lays great emphasis upon the importance of aiding and encouraging the younger men of science through the award of grants for investigation. That this feeling is general throughout the German academies is shown by the fact that approximately one half of their resources are used for this purpose. Diels also finds cause for congratulation in the fact that the papers of these non-academicians, published in the proceedings, often prove to be the most brilliant of Germany's contributions to science, and at the same time greatly aid in enlivening the work of the Academies.[24]

Nothing could point more clearly to the best field of usefulness of our own National Academy. As the future of research depends directly upon the younger men, the Academy may properly devote a large share of its efforts to their support and advancement. But moral encouragement is no less important than financial aid. The latter may well be given from the trust funds of the Academy, but the former should not be neglected. The Academy does grant medals, but these are available in only a few fields of research.[25] Fortunately it also possesses a still more powerful resource in its opportunity to be-

[23] "Die Kultur der Gegenwart," Teil I., Abteilung I., zweite Auflage, p. 666.

[24] Diels, *ibid.*, p. 665.

[25] An attempt should be made to secure medals (or preferably money prizes available for the purchase of books or instruments) for mathematics, engineering, chemistry, geology, and the various branches of biology.

stow all the advantages and privileges of actual membership.

MEMBERSHIP

The great European academies differ among themselves in many particulars, most of all as regards membership. At one extreme we find the St. Petersburg Academy, with a president, a director and fifteen members, who are paid good salaries and provided with dwelling houses and laboratory facilities. At the other extreme stands the Royal Society, with 477 members, who receive no salaries or other tangible benefits. The other leading academies, such as Berlin, Paris, Rome and Vienna, lie between these limits.[26]

The large membership of the Royal Society probably reflects, in some degree, the strongly democratic tendencies of England. But the working body of scientific investigators is sufficiently large to prevent the distinction of election to this venerable society from being impaired. In fact, on account of the great pains taken by the Council to inquire into the qualifications of the fifteen Fellows elected annually, the significance of the coveted title of F.R.S. is perhaps even greater to-day than at any earlier period in the history of the Society.

It can hardly be doubted that investigators of real ability are quite as numerous in the United States as in England. The available statistics indeed indicate that a much greater number of men are engaged here in research. The conditions are thus very different from those existing in 1863, when the National Academy was founded, with 50 members as its limiting number. Since 1906, when the maximum number of members elected annually was increased from five to ten, there has been a very perceptible change in the spirit of the Academy. By taking in a larger proportion of the younger men actively engaged in research, the Academy has increased its contact with living issues, and made itself more truly representative of American science. For the present, the election of ten new members annually may suffice, but I believe that the time will soon come when the limit should be raised from ten to fifteen.

It can not be gainsaid that a large number of able American investigators, who in England would certainly be elected to membership in the Royal Society, are still outside of our National Academy. The reason for this lies partly in the limit imposed on membership, and partly in the method of nomination, which seems to me susceptible of improvement. One difficulty, which will certainly increase in the future, has come about through the development of new fields of research. A man classed as a mathematician or an astronomer, both of which subjects are well represented in the Academy, is sure to receive consideration when nominations are being made. But if his subject be a comparatively new one, not represented among the nominating sections included in the existing classification of the Academy, his claims to recognition will be much less likely to command due attention. The constitution provides that the Council may nominate new members, but this privilege is exercised only in rare cases, and in any event there are certain disadvantages in this procedure. I trust that some means can be found of improving the system of nominations so as to overcome this difficulty, which now deprives the Academy of valuable members.[27]

As for the qualifications of membership, it can hardly be doubted that the original plan of basing selections solely on the original contributions to science of the candidates should always be maintained. While

[26] See "The Work of European Academies," SCIENCE, 38, 686 et seq., 1913.

[27] [A committee is now at work on this subject.]

it is true that eminent administrators and others who exercise large influence in the intellectual world might prove to be of great service as members of the Academy, a wide departure from this fundamental principle would soon detract from the standing of the Academy as the national representative of original research. Thus while eminent services to the public should by no means be excluded from the field of the Academy's interests, and may well be recognized by the award of special medals founded for this purpose, actual membership should be confined to original investigators.

SCOPE OF THE ACADEMY

Here we may inquire as to the true scope of the Academy's work. In what degree should it confine its choice of members to the physical and natural sciences, and in what measure may it recognize successful research in such fields as philosophy, archeology, political economy, and history? The answer to this question will depend in part upon one's opinion of the chief object of the Academy. There are those who feel that the most important function of the National Academy is to confer distinction by election to membership. If this were its prime object, the participation of the members in the work of the Academy would be a minor matter, and any one of sufficient reputation as an investigator might be chosen. But if we agree, as I think the large majority will, that the Academy should be looked upon as a working body, and that its privilege of conferring distinction by election to membership is only one of many important functions, it seems to me that a means of defining our choice of investigators in the humanities may easily be found.

A single philologist, or a single political economist, may find but little of interest to himself in the proceedings of a body made up almost exclusively of representatives of the physical and natural sciences. If so, he may not attend the meetings, and his membership would then serve merely as a mark of distinction. Deferring for a moment the discussion of the broad question whether the Academy should ever be reorganized in two or more large classes, after the manner of the Berlin Academy, it seems to me that we should augment the value of election by furnishing real reason to every member for participation in the work of the Academy. For example, in its committee on anthropology and psychology the National Academy now has three members engaged in the study of archeological problems. Although their work relates primarily to American ethnology, it differs in no essential respect from that of the classical archeologist or the student of Egyptology or Assyriology. Would it not be advisable, therefore, when the Academy chooses its next member from outside the domain of the physical and natural sciences, to elect an archeologist from one of these fields? If this were done he might be expected to take a more active interest in the work of the Academy, which would benefit by his contributions to its proceedings.[28]

The advantages which might result from a wider extension of the scope of the National Academy raise the question whether an organization resembling that of the Berlin Academy will ever become desirable. This problem was long and seriously discussed by the Royal Society, and the negative decision of its deliberations led to the establishment of the British Academy. In spite of this decision, some of its leading

[28] William Dwight Whitney and William James resigned from the Academy, probably because they were the sole representatives of their subjects.

Fellows still believe that the Royal Society should have made room for a larger body of philosophers, historians and philologists than it now contains. Both the Royal Society and the National Academy have wisely refused to limit their membership to the physical and natural sciences. Such historians as Bryce and Morley and such Egyptologists as Petrie are now counted among the Fellows of the Royal Society, and Weld states that 116 archeological papers were published in the *Philosophical Transactions* before 1848.[29] But the large proportion of Fellows concerned with the physical and natural sciences, and the failure of the Society to recognize the philosophical-historical group in its organization, has prevented the Royal Society from taking part in the Section of Letters of the International Association of Academies, where the British Academy now represents England.

The National Academy, as a member of the Section of Science of the International Association, is in a position to secure adequate representation in foreign affairs of American interests in the natural sciences. The United States are also entitled to representation in the Section of Letters, but the present organization of the National Academy and the absence of a national body similar to the British Academy,[30] still leaves a vacancy there.

In my opinion it would not be advisable, under present conditions, to reorganize the National Academy on the model of the Berlin Academy. But I am heartily in sympathy with the idea of widening its scope and its field of interests, in some such way as that indicated above. This plan would permit the Academy to honor able investigators outside of the physical and natural sciences, and at the same time gradually to build up small groups of these members who would aid the Academy in the development of its work. Ultimately the Academy might extend this phase of its activities sufficiently to secure representation in the Section of Letters of the International Association of Academies.

[29] "History of the Royal Society," Vol. 2, p. 565.

[30] The National Institute of Arts and Letters occupies a different field.

LOCAL ACADEMIES

A subject to which I have devoted special attention in the study of the problems of the National Academy, is its relationship to the various local academies which are widely distributed over the United States. These societies are of the greatest importance in the further development of American research, and the cultivation of an intelligent interest in the problems of science. Some of them have grown to such large proportions and established such excellent organizations that they need no assistance or encouragement from the National Academy. But after these exceptional societies have been excluded, there remain a great number of others, which the National Academy ought to be in a position to assist in various ways.

In an early period of its history, the Paris Academy of Sciences established close official relations with certain provincial academies in various parts of France. In fact, the Society of Montpellier is described in its royal letters patent as "an extension and a part" of the Paris Academy of Sciences.[31] But a general plan of federation between the provincial academies and the Institute of France, such as that described by Bouillier in the work just cited, has never been carried into effect, and the old official relations have been discontinued. After careful consideration of Bouillier's

[31] Bouillier, "L'Institut et les Académies de Province," p. 70.

plan, I doubt whether it could be advantageously applied in the United States under existing conditions.

This conclusion, however, does not mean that the National Academy can not be of service to local organizations. I believe, on the contrary, that it might find many ways and means of aiding them. The prime object is to secure a high standard of accomplishment among the minor academies remote from the chief centers of research, and to give the encouragement which the production of good work under unfavorable conditions so richly deserves. It should be possible to discover methods of realizing these ends, and thus to contribute to the strength and standing of the local academies and the progress of American research.

[It will be noticed that comparatively little attention has been given in this paper to the relationship of the Academy to the national government. This is due to no underestimate of the importance of the connection, but rather to the strong desire that this chief implication of the Academy's charter should ultimately be realized in the fullest sense. Valuable suggestions for cooperation with various departments of the government have been made by Academy members, and every effort should be exerted to carry them into effect. But recent experience indicates that the most promising way to accomplish this lies in first developing the standing and prestige of the Academy. When it becomes more widely and favorably known for its contributions to scientific progress, and is universally recognized as the national and authoritative representative of American science, the Academy's influence with Congress and with the various officers of the government will be far more potent than at present. I therefore believe that no effort should be made to press a demand for greater government recognition until the publication of the *Proceedings* and other new activities have had time to produce their anticipated effect.]

In summarizing the suggestions offered in this paper, we see that many of the new activities proposed for the National Academy can not be undertaken without a suitable building. If this can be obtained, and adequately endowed, the Academy will be able greatly to extend its influence and usefulness both at home and abroad, through original researches, increased service to members, public lectures and exhibits, and greater cooperation in international projects. Under present conditions, the International Association of Academies could hardly be invited to meet in Washington. But if established in a home of its own, the Academy might ultimately succeed the Royal Society and the Academies of Paris, Rome, St. Petersburg and Berlin as the leading Academy of the Association for a period of three years. In this position it could contribute in a more effective way to the furtherance of international science, and to the study of the great problems of cooperative research, which offer large possibilities of extension and development.[32]

The one way to secure a building and endowment is to prove by continual increase of efficiency that the Academy can use them to advantage. The establishment of *Proceedings*, the institution of lecture courses, the encouragement of broader methods of science teaching, and closer identification with the general interests of science as represented in all movements for the promotion of research and the diffusion of scientific knowledge, are opportunities open to immediate realization, and deserving of

[32] I hope to discuss the international relations of the Academy in a future article.

the most careful consideration by the Academy.

GEORGE ELLERY HALE
MOUNT WILSON
SOLAR OBSERVATORY

SCIENTIFIC NOTES AND NEWS

THE sixty-sixth meeting of the American Association for the Advancement of Science, in conjunction with a large number of national scientific societies is meeting in Philadelphia, as we go to press, under the presidency of Dr. Charles W. Eliot, of Harvard University. The address of the retiring president, Dr. Edmund B. Wilson, of Columbia University, is printed in the current issue of SCIENCE. We hope to print next week an account of the meeting to be followed by the more important addresses and papers and accounts of the proceedings of the section of the association and of the national societies.

DR. C. S. SHERRINGTON has been elected Fullerian professor of physiology at the Royal Institution for a term of three years, the appointment to date from January 13, 1915.

AT the annual meeting and election of the Academy of Natural Sciences, held on December 15, the following were elected: *President,* Dr. Samuel G. Dixon; *vice-presidents,* Edwin G. Conklin, Ph.D., and John Cadwalader; *recording secretary and librarian,* Dr. Edward J. Nolan; *corresponding secretary,* J. Percy Moore, Ph.D.; *treasurer,* George Vaux, Jr.; *curators,* Dr. Samuel G. Dixon, Henry A. Pilsbry, Dr. Witmer Stone and Dr. Henry Tucker; *councilors,* Charles B. Penrose, Charles Morris, Spencer Trotter and William E. Hughes.

DR. LOUIS SCHAPIRO, of Milwaukee, has accepted an appointment on the International Health Commission of the Rockefeller Foundation. After traveling through the southern states with other members of the commission, Dr. Schapiro will go to Costa Rica. After initiating work in the eradication of intestinal parasites, he will leave it in charge of local physicians and then probably will take charge of the work in northern Egypt.

R. D. HETZEL, director of extension for the Oregon Agricultural College, has been appointed chairman of the extension section of the American Association of Agricultural Colleges and Experiment Stations for the coming year.

SIR ERNEST and Lady Rutherford and Miss Eileen Rutherford spent a week in Montreal on their way home from New Zealand. Sir Ernest addressed the Physical and Chemical Societies of McGill University at a joint meeting on December 23, on "The Spectrum of X-rays and γ-rays."

FOR the purpose of studying the art, history and ethnology of China at close range, an expedition soon will be sent abroad by the University of Pennsylvania Museum, under the direction of C. W. Bishop, who has been curator since last June. His appointment was made with the idea of his leading this expedition. Mr. Bishop will first study Chinese art collections in the ancient cities of Japan, at Nikko, Nara and Kioto, where the temples and palaces contain some of the finest specimens in the world. He will then proceed to China, and his first explorations will cover a year of preliminary work. Special attention will be given to the art and ethnology of the Shans, Lolos and Miotses, which are remnants of the primitive tribes before the Chinese invasion.

DR. SIMON R. KLEIN, formerly professor of histology and embryology in Fordham University School of Medicine, New York City, has been appointed pathologist of the Norwich State Hospital for the Insane.

THE professors of chemistry of The Ohio State University gave a complimentary dinner on December 18 to Mr. John J. Miller, who is retiring from the editorship of *Chemical Abstracts.*

THE natural history department of the British Museum has the following men serving at the front in the war: Captain E. E. Austen (Diptera), with the 28th County of London Regt. (Artists Rifles); private K. G. Blair (Coleoptera), with the 4th Battalion Seaforth Highlanders; Lieutenant N. D. Riley (Lepi-