SCIENCE

VOL. LIX FEBRUARY 1, 1924 No. 1518

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

THE SCIENCE PRESS

Lancaster, Pa. Garrison, N. Y.

New York City: Grand Central Terminal.

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.

Entered as second-class matter July 18, 1923, at the Post Office at Lancaster, Pa., under the Act of March 3, 1879.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

THE PERMANENT SECRETARY'S REPORT ON THE CINCINNATI MEETING. II

SECTION G (BOTANICAL SCIENCES)

(Continued)

The Physiological Section, B. S. A.

Chairman, Lewis Knudson.

Secretary-treasurer, R. B. Harvey, University Farm, St. Paul, Minn.

(Report by Charles H. Shull)

The physiological section held independent sessions Thursday afternoon, Saturday forenoon and afternoon and Monday forenoon. Friday forenoon there was a joint session of the section with the Ecological Society of America, devoted to a symposium on water relations. All but the last session were well attended; too many botanists had returned home before Monday. At the first session a number of papers were presented dealing with the influences of hydrogen-ion concentration on growth and metabolism, especially of fungi. One of the main contributions dealt with the isoelectric points of plant tissues. Dr. W. J. Robbins showed that plant tissues in buffer solutions of different hydrogen-ion concentration behave similar to proteins, with definite isoelectric points. Others presented evidence of changes in the hydrogen-ion concentration from one developmental stage to another in wheat, and of diurnal acidity changes in the leaves of Bryophyllum. The closing paper on the program, by W. B. Davis, traced black-heart of the potato to high respiratory activity in cases where high temperature is the environmental condition inducing the breakdown.

In the symposium on "Water relations," the history of some aspects of research in this field was sketched by Dr. B. E. Livingston, from the time of Bellani to the present, with special emphasis on the development of atmometry, and of instruments for the study of water delivery by soils. The part that imbibition plays in plant life was discussed by Dr. Charles A. Shull, who considered the problems of molecular physics involved in evaporation of water and in the

development of saturation deficits in the leaf. The major force involved appears to be the kinetic activity of water, which is estimated as 1350 atmospheres at ordinary room temperatures. The water requirements of plants were discussed by Dr. H. L. Shantz, who pointed out differences between plants that transpire at temperatures lower than the air, and those that transpire at temperatures higher than the air. Soil-moisture relations were considered by Dr. J. S. Cole, and osmotic relations by Dr. J. A. Harris, who showed that the osmotic concentration of the tissue fluids of plants is closely correlated with the environmental conditions under which the plants are grown.

The influence of the carbohydrate-nitrogen relation on growth responses, and that of the relative length of day and night on the fruiting responses of plants were features of the Saturday morning session. It is becoming clear that the internal nutritive conditions have much to do with correlations, and with the control of behavior; also, that various factors, such as phosphorus supply, temperature, light and nitrate supply may modify behavior by modifying internal conditions.

In the afternoon session of Saturday, Professor F. E. Lloyd gave a beautiful demonstration of the origin and growth of calcium oxalate druses, showing that they are quite independent of nuclear growth. This question had caused some discussion at the Boston meeting last year. Professor Lloyd's photographs were very convincing. He also presented some of the difficulties of detecting potassium in plants by microchemical methods, the reactions being accompanied by the formation of Liesegang rings in the tissues. The relation of iron to plant growth was discussed by R. B. Marsh, who reported that plants may be chlorotic from too much as well as from too little iron. The iron balance for health must fall in a rather narrow range, and in health the iron has an even distribution in the tissues of stem and leaf.

The closing session, Monday forenoon, was marked by several very interesting contributions. A method of coloring tangerines to hasten their preparation for market was described by Dr. W. A. Gardner. Ethylene, among other gases, may be used. The use of the König-Martens spectrophotometer in measuring the quantity of carotinoids and other pigments was described by Dr. F. M. Schertz. The method is very accurate, but the instrument is too expensive for ordinary laboratories. A unique feature was a moving picture of "trembles" in cattle and sheep from eating Eupatorium, shown by Dr. C. Dwight Marsh, of the U. S. Department of Agriculture. The Eupatorium theory is a very old one, but was at one time discredited by the department. This fact may have delayed recognition of the true cause of "trembles." This rectification of an earlier error by the department is very praiseworthy. Corrections should always be made with great promptness as soon as the real facts are known.

The Mycological Section B. S. A.

Chairman, Wm. H. Weston, Jr., Harvard University, Cambridge, Mass.

(*Report by Wm. H. Weston, Jr.*)

Professor H. S. Jackson, of Purdue University, LaFayette, Indiana, was unanimously elected chairman of the section for 1924. The section unanimously adopted a resolution expressing appreciative thanks to Mr. C. G. Lloyd for hospitality extended to the mycologists during the meeting period, and also gratefully acknowledging the great service Mr. Lloyd has rendered to science through the Lloyd Library and the Lloyd Museum in Cincinnati and through his untiring efforts to advance mycology. The section held two sessions, Friday and Saturday forenoons. About 26 papers were presented, with about 50 in attendance. On Saturday afternoon it joined the Phytopathological Society in a session of interesting technical contributions on fungi and the mycological aspect of many plant diseases. At the forenoon sessions many mycological subjects were discussed. E. F. Guba and P. A. Young, of the University of Illinois, called attention to a comprehensive bibliography of mycological monographs that they have recently prepared. Recent work on aquatic fungi was well represented, with papers by W. C. Coker and J. N. Couch, E. M. Gilbert, J. A. Lounsbury and W. H. Weston, Jr. Professor J. C. Arthur gave an account of fern rusts and discussed their importance in the phylogeny of the Uredinales. Leva B. Walker, of the University of Nebraska, pointed out the importance of glycogen (which suddenly changes to glucose) in the explosive ejection of spores in Sphaerobolus, for example. A. H. R. Buller presented interesting details of spore dispersal in *Sphaerobolus stellatus* and pointed out that mycelia and fruiting bodies of *Panus stypticus* are luminous in the American strain of this fungus but not so in the English strain; yet the two strains exhibit hyphal fusions when brought together.

The American Phytopathological Society

President, G. R. Lyman.

Secretary, R. J. Haskell, U. S. Department of Agriculture, Washington, D. C.

(*Report by R. J. Haskell and C. R. Orton*)

Approximately 140, or 25 per cent. of the members of the Society, were present at its fifteenth annual meeting held December 23 to January 1. This was by far the largest annual gathering of the society, the attendance at the Boston, Toronto and Chicago meetings being 95 (17 per cent.), 85 (16 per cent.) and 110 (21 per cent.) respectively. Recognition of the seventy-fifth anniversary of the American Association and the fifteenth anniversary of this society

was given on the occasion of the Phytopathologists' dinner, when two of the most distinguished members, Dr. L. R. Jones, of the University of Wisconsin, and Dr. J. C. Arthur, of Purdue University, spoke on the history of American plant pathology.

Three joint sessions with other societies were held; namely, that with Section G of the American Association, that with the Mycological Section of the Botanical Society of America (at which papers of mycological and pathological interest were presented) and a symposium with the horticulturists and nursery inspectors on the subject of crown gall. The purpose of the crown gall symposium was to sift facts and theories relative to the economic importance of crown gall and to formulate recommendations for the improvement of crown gall inspection. Four members of a special committee (a nurseryman, a nursery inspector, a horticulturist and a plant pathologist) presented formal papers on crown-gall inspection. After the symposium the committee worked out a set of principles for nursery inspection with respect to crown gall and the report stating these principles was adopted by the Society and by the American Association of Economic Entomologists. It is soon to be distributed.

At the regular sessions of the society 114 papers were presented. They may be summarized in groups and a few of the contributions may be mentioned. Ten papers reported the occurrence of new diseases. Perhaps the most generally interesting of these is the reporting of chestnut blight in Europe, by Haven Metcalf, of the U. S. Department of Agriculture. This is probably the first report of this disease on that continent. A portion of one session was devoted to mosaic and related diseases of plants; while the cause of mosaic is still a mystery, nine papers, with distinct contributions, were presented. L. O. Kunkel, of the Thompson Institute for Plant Research, submitted evidence to show that aster yellows is transmitted by a specific leaf hopper, while a second specific leaf hopper and the tarnished plant bug failed to transmit the infectious principle. The finding of a flagellate in latex of the common milkweed was reported and demonstrated by Francis O. Holmes, also of the Thompson Institute for Plant Research. Bodies, similar to those reported by Kunkel and McKinney, were demonstrated by James Johnson and T. E. Rawlins, of Wisconsin, in tobacco leaves affected with mosaic. Sixteen papers were of a general nature, each dealing with one or more diseases and were for the most part descriptive. Studies on the etiology of diseases were represented by about seven papers. The most noteworthy of these, and without doubt one of the outstanding contributions of the entire meeting, was a paper by Nellie A. Brown, of the U. S. Department of Agriculture, on "An apple stem tumor, not crown gall." Miss Brown showed that much of the so-called aerial crown gall of apple trees is not true crown gall caused by *Bacterium tumefaciens,* but should be considered as a plant tumor, which probably has some relation to injurious over-growth produced by woolly aphis. Four papers on the relation of soil temperature and soil moisture to diseases were presented from the Wisconsin Experiment Station. The diseases studied were club root of cabbage, onion smut, crown gall and seedling blight of wheat and corn. G. B. Sanford, of the Minnesota Agricultural Experiment Station, indicated that soil moisture conditions are more important in connection with potato scab than has heretofore been realized. In two papers by A. J. Mix, of the University of Kansas, the isolation and culture of the peach leafcurl fungus (*Exoascus deformans*) and of another Exoascus occurring on certain fruits were reported for the first time. The fungus was inoculated into peach buds with resulting infections. These papers make one of the greatest contributions of the meeting, as this is the first time that the leaf-curl fungus has been grown in culture and successfully inoculated into peach trees.

At an informal session of members of the Society on Sunday it was formally recommended that fungus species and varieties be recognized on morphological characters, that physiologically specialized forms of fungus species and varieties showing no morphological differences be called physiological races, and that Latin names be not generally attached to these. Four papers dealt directly with these physiological races, and they were considered in a number of others. Four papers dealing with disease transmission were given. One, by W. D. Valleau and Charles Hubbard, reported that the wild-fire and leaf-spot organisms of tobacco are spread in the plant bed, due to weeders chewing the last year's leaves and spitting on the seedlings. The authors think that chewing tobacco is the chief source of plant-bed infection in Kentucky. L. H. Pennington pointed out that the spores of white pine blister rust are blown as much as 150 miles with resulting infection.

The securing of varieties of plants resistant to disease may be the ultimate solution of all plant-disease-control problems and progress toward this end is being rapidly made. Eleven papers were presented on this subject. Progress was reported in obtaining varieties resistant to the following diseases: bunt of wheat, wheat mildew, crown rust of oats, anthracnose and mildew of red clover, potato wart, black shank of tobacco, tobacco root rot, tomato wilt, onion smut and root knot of peach. Studies on other phases of disease control were reported in about 25 papers. Ten of these dealt with seed disinfection experiments, five

with soil treatments, seven with spraying, and three with eradication measures. Distinct progress is being made in the further development of seed treatments, especially for cereal diseases. A new seed disinfectant, silver nitrate, has been developed by James Johnson and W. F. Murwin, of Wisconsin, for treating tobacco seed. Caroline Rumbold, of the U. S. Department of Agriculture, has perfected a quick method of treating sugar-beet seed with a mixture of formaldehyde vapor and steam.

We have been seeking for years to simplify methods for the protection of plants from diseases and pests and to work out one treatment which would apply to many troubles. That this is being gradually accomplished is evidenced by the work of E. E. Clayton, W. O. Gloyer and H. Glasgow, of the New York Agricultural Experiment Station, Geneva, N. Y., who have shown that corrosive sublimate of standard strength is effective in controlling not only cabbage maggot but also the black rot, blackleg, club root and Rhizoctonia diseases of cabbage and related plants, when this material is applied at two or three critical times to the soil in the seed bed.

Seven papers were concerned with the application of sprays and dusts in disease control. G. W. Keitt and L. K. Jones, of Wisconsin, showed that two pre-blossom treatments with fungicides are important in controlling apple scab. These authors also showed that a pre-blossom spray against cherry leaf-spot may just as well be omitted. H. C. Young reported that precipitate sulphur may be applied to the most succulent foliage—apple, peach, grape, cherry, pear—without leaf injury. This and colloidal sulphur both control apple scab. Three papers dealt with methods and materials. James G. Dickson, of Wisconsin, reported on experiment chambers with automatic control of humidity and temperature. G. H. Coons, of Michigan, reported on tests with dehydrated culture media. Twelve papers were on miscellaneous subjects. Four of them reported progress in the solution of the corn root-rot and ear-rot problem. A paper by Robert B. Wylie, of the University of Iowa, on wound healing of mesophytic leaves, was one of the prominent contributions of the meeting.

ORGANIZATIONS RELATED TO BOTH SECTIONS F AND G

At the Cincinnati meeting sessions were held by the five general biological organizations reported below.

The American Society of Naturalists

President, R. A. Emerson.

Secretary, A. Franklin Shull, University of Michigan, Ann Arbor, Mich.

(*Report by A. Franklin Shull*)

The American Society of Naturalists held two sessions on Saturday, one of a miscellaneous nature in the forenoon and a symposium, with the Society of Zoologists and the Botanical Society, in the afternoon. At the former were read papers in botany and zoology, some of them accounts of individual research, others discussions of a general nature. Excellent examples of the research papers were: (1) that of C. R. Moore on the temperature susceptibility of the mammalian testis, in which it was shown that relatively high temperatures cause degeneration of that organ and that the scrotum is a temperature regulator; (2) that of Carl Hartmann, who reported on his studies of the development and breeding habits of the opossum, noting the discovery of some class characters not hitherto recognized in this group. Of the more general papers on the morning program may be mentioned one by G. H. Parker on organic determinism in which diverse types of activity were related to diverse types of organization. While an argument for choice and freedom, the paper might have been seized upon in parts by both mechanists and vitalists, perhaps with equal dissatisfaction to both. An evolutionary discussion of considerable interest was contained in the paper of M. M. Metcalf, who traced the evolution of three separate potentialities in a group of parasitic protozoa. The afternoon symposium had for its general topic "Morphogenesis." This was discussed by R. A. Harper from the standpoint of the interaction of cells, with analogies from crystals. C. M. Child treated the subject from the point of view of differential susceptibility, illustrating the relation of form to susceptibility gradients in frog embryos, planarians and other animals. An analysis of one group, the higher fungi, with respect to origin of form, was made by A. H. R. Buller, while Ralph S. Lillie discussed morphogenesis from the fundamental standpoint of the physics and chemistry of protoplasm. In the arrangement and presentation of the symposium the society was joined by the American Society of Zoologists and the Botanical Society of America.

The dinner of the society on Saturday evening at the Gibson Hotel was highly successful on both the material and the spiritual side. One hundred and sixty-eight were in attendance, more than at any earlier dinner of the society, excepting the Boston dinner a year ago. After the dinner R. A. Emerson gave the presidential address, on "A genetic view of sex expression in flowering plants," in which he pointed out that, with respect to its transmission, sex does not differ from other inherited characters.

The Ecological Society of America

President, Charles C. Adams.

Secretary, A. O. Weese, James Millikin University, Decatur, Ill.

(*Report by A. O. Weese*)

The society held sessions on Friday, Saturday and Monday, a conversazione Sunday evening and a dinner Monday evening. The opening session Friday forenoon was held jointly with the Physiological Section of the Botanical Society of America and was devoted to a symposium on "Water relations." This has been reported for the Botanical Society under Section G. Another joint session, held with the American Society of Zoologists, was held Saturday forenoon. It included twenty papers mainly on aquatic animal ecology, several of them reporting notable contributions. The Friday afternoon program included 14 papers, mostly on plant ecology. Among these, William S. Cooper reported on "Vertical photographs of quadrats," J. E. Weaver reported on the "Direct measurement of water loss from vegetation without disturbing soil structure," and George B. Rigg discussed "Plant succession in some sphagnum bogs of the northwest." The society held a symposium Saturday afternoon, on the "Relation of general ecology to human ecology." William M. Davis discussed the relations of the atmosphere to organisms, H. L. Shantz discussed the relations of plant ecology to agriculture, Roswell H. Johnson discussed the relations of ecology to society and human behavior, and Clark Wissler discussed the relations of nature to man, with special reference to the North American Indians. The symposium was very inspiring and unusually successful. A joint session was held Monday forenoon with the Wilson Ornithological Club (which see), at which five papers, mainly on avian ecology, were presented. A paper on the "Food habits of the American eagle," by F. H. Herrick, was of special interest. Charles Dury spoke on the "Westward spread of the European starling," with notes on its breeding in Ohio. The Monday afternoon session was devoted to Ohio ecology. The program may well serve as a model for the future presentation of similar material for other states. Discussions of primitive plant successions in several areas were followed by the consideration of secondary successions and crop-plant succession. The session closed with a series of papers on animal successions in Ohio.

V. E. Shelford presented, at the business session, a report of the Committee on the Preservation of Natural Conditions, which has now worked six years and has prepared a 1,300-page manuscript of descriptions of natural American areas north of the Amazon that should be preserved. It is hoped that this may soon be published as a "Naturalists' Guide." Dr. Forrest Shreve was elected editor for this project. The committee appointed to study the project to create a national park in the region of Glacial Bay, Alaska, reported favorably. The committee was continued, with William S. Cooper as chairman. The following officers for 1924 were elected: *President,* Edgar N. Transeau, Ohio State University; *vice-president,* W. C. Allee, University of Chicago; *secretary-treasurer,* A. O. Weese, James Millikin University, Decatur, Ill.; *editor* of *Ecology,* Barrington Moore, New York City; *representatives in council of Union of American Biological Societies,* Barrington Moore and H. H. T. Jackson; *representatives in the council of the American Association for the Advancement of Science,* Charles C. Adams and G. A. Pearson.

The Joint Genetics Section of the American Society of Zoologists and the Botanical Society of America

Chairman, E. M. East.

Secretary, D. F. Jones, Drawer 1106, New Haven, Conn.

(*Report by D. F. Jones*)

This section held three sessions at Cincinnati, Thursday forenoon and afternoon and Friday forenoon. The first was devoted to 17 papers dealing with plant genetics, the second to recent work on the genetics of Datura, and the last to about 17 papers on animal genetics. At the first session the inheritance characters in crop plants were considered in detail by numerous investigators. Why some tomatoes are round and smooth, some flat and wrinkled, was explained in terms of heredity by Paul G. Warren, of the College of William and Mary, while a similar study of sizes and shapes of squashes was reported by E. W. Sinnott, of the Connecticut Agricultural College. R. A. Brink and J. H. MacGillivray, of the University of Wisconsin, reported chemical differences in the pollen of certain maize types, concomitant with corresponding differences in the ability of the pollen to fertilize ovules and to produce seed. A similar selective fertilization was shown in other maize types by D. F. Jones, of the Connecticut Agricultural Experiment Station. Professor C. E. Allen, of the University of Wisconsin, reported a case of sex-linkage in plants corresponding to many familiar cases in animals. W. H. Eyster, of the University of Missouri, discussed variegation in the seed-coat of maize and suggested that genes may be further divisible into gene elements, certain combinations of which may be relatively unstable.

At the Friday forenoon session considerable time was given to the inheritance of specific characters in small, rapidly breeding animals, such as rats, mice, guinea pigs and insects. Dr. A. W. Banta, of the Carnegie Institution of Washington, showed that reproduction without the usual sexual process is not attended by degeneration, nor by increase in the number of male offspring, in the case of a daphnid with which he has worked. Dr. Oscar Riddle, also of the

Carnegie Institution, described a female dove in which the sex behavior changed to that of a male, apparently because of tuberculous infection of the ovaries. Other remarkable cases of gynandromorphs were presented by Dr. P. W. Whiting, of the University of Iowa.

At the Thursday afternoon session a detailed study of mutation in Datura was presented, based on the recent work of Dr. A. F. Blakeslee, of the Department of Genetics, Carnegie Institution of Washington, Cold Spring Harbor, N. Y., and his coworkers.

The American Microscopical Society

President, Chancey Juday.

Secretary, Paul S. Welch, University of Michigan, Ann Arbor, Mich.

(*Report by Paul S. Welch*)

The forty-second annual meeting of the Society was held on Saturday, with a single business session. Great gratification was expressed at the present state of the Spencer-Tolles Fund, which now exceeds $10,000, and a vote of hearty congratulations was extended to the custodian, Magnus Pflaum, for the splendid growth of this fund. The following officers were elected: *President,* B. H. Ransom, U. S. Bureau of Animal Industry; *vice-presidents,* F. H. Krecker, Ohio State University, and W. E. Allen, Scripps Institution for Biological Research; *members of executive committee* for 1924, George R. La Rue, University of Michigan; Z. P. Metcalf, North Carolina State College of Agriculture and Engineering, and E. M. Gilbert, University of Wisconsin.

The American Nature Study Society

President, William G. Vinal.

Secretary, Mrs. Anna B. Comstock, 123 Roberts Place, Ithaca, N. Y.

(*Report of Anna B. Comstock*)

The eighteenth annual meeting of the Society was held on Thursday and Friday, with four sessions for presentation of papers and one "dinner session," at all of which President W. G. Vinal presided. At the Thursday forenoon session, Elliot R. Downing, University of Chicago, gave an illustrated talk on "Science teaching in European schools." Dr. Downing found that about one third of the time spent in the secondary schools of France is devoted to science, with a great preponderance of physics and chemistry and comparatively little botany and zoology. In elementary and secondary schools there is no laboratory work except such demonstration as is given by the teacher. There is no time limit for passing through the school system which is essentially a process of elimination; tests are very rigid and if a student succeeds in entering the university he is sure to be of excellent capacity. Catherine E. Reed, Buffalo State Normal School, suggested the following principles for a course in nature-study: The course should follow the bent of the child's mind rather than that of his teacher, it should have a definite goal, should be closely related to his community rather than that of a prescribed course, and it should be made the child's property through expression from him. Anna Botsford Comstock summarized the history of the *Nature Study Review,* from its inception in 1905 until its present merging with the *Nature Magazine.*

At the Thursday afternoon session, E. Laurence Palmer, Cornell University, gave a talk on "Nature games and nature study," in which he described many interesting educational games devised by himself. Charles O. Beanman, Brockport Normal School, gave a nature-study lesson on the subject, "Why we have winter." According to Dr. Beanman, children usually fail to understand the significance of the inclination of the earth's axis as a reason for change of season, so he has devised several simple demonstrations and diagrams that may be used to clarify this point. It was pointed out by J. A. Drushel, Harris Teachers College, that the laboratory work given in most college biology courses is of little direct use to the nature-study teacher. Too much time is spent in the study of a few things in the laboratory and not enough in observing the multitude of things out-of-doors. Laboratories should be used as libraries for studying subjects observed out-of-doors. Dr. Drushel remarked that a nature-study teacher should know something of sciences other than biology, especially geology and physics. William G. Vinal, Rhode Island College of Education, discussed nature-study clubs and told of the Woodcrafters of Quinsnicket, a section of the Providence Handicraft School.

On Thursday evening about 40 members attended the society dinner, which was followed by a charming lecture by Professor Elliot R. Downing, of the University of Chicago, illustrated by his own photographs, on the mountains of Southern France, made famous by Stevenson's "Travels with a Donkey."

The Friday morning session began with an address by M. R. Van Cleve, Toledo Elementary Schools, in which he spoke of some of the encouraging and discouraging circumstances about the establishing of nature-study as a part of the school curriculum. He pointed out a present need for an aggressive policy on the part of nature lovers, because the present is a critical time, when school curricula are being generally revised. Harold L. Madison, Cleveland Museum of Natural History, gave an inspiring account of educational work now being done by the Cleveland Museum. Ellis C. Persing, Cleveland School of Education, gave the results of an interesting test which he devised to ascertain whether teachers remembered the subject-matter and principles of the science work which they had taken while in school. The test con-

sisted of 25 simple questions—such as, "What makes the rainbow?" The last paper was given by Wm. T. Heilman, Columbus Normal School, on "Training of teachers for nature study while in service." Professor Heilman pointed out that many teachers fail to grasp the real significance and importance of nature-study, do not know how to handle it—do not know how to begin, continue and end the study of an object. A difficult problem in a large city is to get the right kind of help to the teachers that need it. Professor Heilman described the system in use in Columbus and reported that the results have been very gratifying, that scores of teachers have become regular outdoor students.

At the business meeting it was voted that the annual dues of active members shall be $2.50, and that active members are to receive the *Nature Magazine*. M. R. Van Cleve, Toledo Public Schools, was elected president for 1924 and Mrs. Anna Botsford Comstock was reelected secretary and editor of the section on Nature-Study Review in the *Nature Magazine*.

SECTION H (ANTHROPOLOGY)

Vice-president and chairman, E. A. Hooton.
Retiring vice-president, T. Wingate Todd.
Secretary, R. J. Terry, Washington University School of Medicine, St. Louis, Mo.

(*Report by R. J. Terry*)

The meeting of Section H was held on Friday and Saturday. In affiliation with the section, a conference of the committee and representatives of State Archeological Surveys, National Research Council, held sessions on Monday. The Friday morning session was devoted to physical anthropology, beginning with the original and stimulating paper of the retiring vice-president, Dr. T. W. Todd, on the selection of a population, and including contributions on human evolution, on the American negro, variation in man, the weights of bones and other results of laboratory research—all important additions to our knowledge of the physical status of man. The Friday afternoon session was largely occupied by a symposium on the principal American anthropological collections and the opportunities for research which they offer participated in by representatives of the following institutions: American Museum of Natural History, Carnegie Institution of Washington (Departments of Embryology and of Genetics), Harvard University, Museum of the American Indian, University of California, United States National Museum, and Western Reserve University. The session was concluded by an interesting survey of the great mass of evidence of early man in Europe by Dr. Aleš Hrdlička in an illustrated, semi-public address before a large audience. The program of the Saturday morning session, introduced by the practical recommendations of Dr. E. A. Jenks's paper on abstracting anthropological literature, dealt largely with anthropological studies of the American Indian. Mr. W. K. Moorehead's work at Cahokia and the difficulties he encountered in securing cooperation were presented. A new addition to the program of the section was an exhibition of specimens, apparatus, photographs and other pictures, arranged for the session of Saturday afternoon. The realistic art shown in the Mimbres pottery (Dr. J. W. Fewkes, U. S. Bureau of Ethnology) was a notable feature of the exhibit. The high quality of this small beginning and the interest shown in it, should encourage the continuance and development of this feature of the meeting. The sessions of Section H were attended by an average of sixty, exclusive of the attendance upon the lecture on "Early man," which numbered nearly three hundred. There were twenty-five papers set for the program and three were read by title. Ten groups of objects were brought to the exhibition.

The Committee on State Archeological Surveys, National Research Council

(*Report by Clark Wissler*)

A conference was held on Monday for the discussion of present policies as now followed to the several states in which archeological work is conducted, and for the consideration of field technique, to the end that the results of such researches may be comparable. Dr. Ames W. Butler, of Indiana, led in discussing the relation of State Geological Surveys to Archeological Work and the coordination of the same with Historical Commissions and State Historical Societies. Dr. W. C. Mills, of Ohio, led in the discussion of State policies for the protection of antiquities and the establishment of State Parks enclosing important archeological sites. Both these topics were fully discussed and the bearing of protective measures upon the encouraging of competent archeologists from non-state institutions to take part in State surveys was carefully considered. The final topic in the program dealt with the desirability of standardization in mapping and recording archeological data, led by Professor Charles R. Keyes, of Iowa. Practically all the states in the Mississippi Valley were represented in this conference and brief reports on the status of archeological research were presented from Ohio, Indiana, Kentucky, Illinois, Iowa, Missouri, Tennessee, Alabama and Mississippi.

SECTION I (PSYCHOLOGY)

Vice-president and chairman, G. Stanley Hall.
Retiring vice-president, Raymond Dodge.
Secretary, Frank N. Freeman, University of Chicago, Chicago, Ill.

(*Report by Frank N. Freeman*)

On account of the fact that the American Psychological Association met in the same general region as the American Association for the Advancement of Science, and at about the same time, Section I held only one session, on Monday, after the close of the meeting of the Psychological Association at Madison. This session was a symposium on "The interpretation of intelligence tests." The first speaker on the program, Dr. L. M. Terman, who was president of the Psychological Association, was unfortunately prevented by illness from attending the meeting. Dr. G. M. Whipple presented a very clear analysis of problems in the interpretation of tests and summarized the best results of research upon them. Dr. J. McKeen Cattell, who is the pioneer in the exact study of individual differences, discussed the broader aspects of the problem of heredity and environment and illuminated the subject of psychological tests from the standpoint of their historical development. The vice-presidential address by Dr. R. Dodge was a very acute discussion, from an experimental standpoint, of human variability. An appreciative audience of 250 heard the addresses. The retiring vice-president for the Washington meeting next year is Dr. G. Stanley Hall. The presiding vice-president for next year is Dr. R. S. Woodworth. The section adopted the following resolution on the election of Dr. Cattell to the presidency of the American Association for the Advancement of Science:

The Section of Psychology of the American Association for the Advancement of Science felicitates itself and the Association upon the election of Dr. J. McKeen Cattell as president of the Association. This election is particularly appropriate on account of the long and distinguished services of Dr. Cattell as an investigator and teacher of experimental psychology, as a scientific student of the careers of scientific men, as an organizer of scientific enterprises, as an editor of scientific and educational journals, and as a leader in the affairs of the Association.

SECTION K (SOCIAL AND ECONOMIC SCIENCES)

Vice-president and chairman, John F. Crowell.

Retiring vice-president, Henry S. Graves.

Secretary, Frederick L. Hoffman, Babson Institute, Wellesley Hills, Mass.

(*Report by Frederick L. Hoffman*)

The section held sessions on Friday, Saturday and Monday, which were fairly well attended. The program was unusually good, with 26 papers, all but four of which were read by the authors in person. The attention given to the sessions by the daily press was the best on record.

The introductory address by the vice-president, Dr. John Franklin Crowell, on "A plea for business strategy in national and international policy," elicited an interesting discussion. This was followed by a stimulating address on "The economic influences of the tire industry," by Mr. D. L. Brown, of Akron. Mr. Brown emphasized the enormous importance of the rubber industry to this country and its basic importance in the further development of motor transportation. Several papers were read on medical and sanitary science, including some very suggestive observations on "What medical science has done for public health," by Dr. Oscar Dowling, president of the Louisiana State Board of Health.

On the second day the morning session was concerned with the discussion of business problems, introduced by a really extraordinary address by Major C. R. Johnson, of the Cleveland Chamber of Commerce, on "A declaration of principles in labor relations." This was followed by a carefully reasoned paper on "Labor relations in the printing trades," by Dr. Francis H. Bird, of Chicago, emphasizing the avoidance of labor controversy by means of committees representing both sides, in the spirit of fairness and in complete possession of all the essential facts. A third paper in this session was on "Progress in business integrity," by Professor Rudolph M. Binder, of New York University. At the afternoon session Mr. Hugo Riemer, of Chicago, read a paper on "Progress in the development of man power since the war," followed by two papers on "Research and profit-sharing," which were read by title. The concluding paper of this session was on "The increased use of metric weights and measures," by Mr. Howard Richards, secretary of the Metric Association, which attracted considerable interest. Mr. Richards emphasized the growing appreciation of the metric system, not only in scientific work, but also to an increasing extent in modern business.

The Monday forenoon session was opened by a paper of absorbing interest on "Development of transportation by air," by Professor Edward P. Warner, of Boston. Professor Warner's observations should attract nation-wide attention, as based upon both a sound and thorough theoretical and practical conception of the situation. Mr. H. T. Newcomb, of the Delaware and Hudson Company, followed with a paper on "Railways under the transportation act," presenting the railway side of what is still a most complex situation. Dr. C. D. Howe, of the University of Toronto, followed with an address on "Economic aspects of the forestry situation in Canada," and admirably presented an argument against ruthless exploitation. Of interest in this connection was an address on "The economic value of scenic national parks and historical sites," by Dr. George F. Kunz, of New York, N. Y.

The final afternoon session was primarily concerned with insurance questions. The audience on this occasion included a large number of representatives of the Cincinnati Life Underwriters Association. The first paper, on "Group Insurance," was by Mr. William J. Graham, of the Equitable Life Insurance Company, of New York. This was followed by an address on "The progress of life insurance in the last five years," by Mr. James S. Elston, of The Travelers', and an admirably reasoned discussion on "Evidence of life insurance progress," by Miss Genevieve M. Carr, of the National Life Insurance Company, of Vermont. The three papers formed a most interesting symposium on the extraordinary progress of modern life insurance since the war, with which there is probably nothing to compare in the other aspects of our recent economic and social development. Mr. Charles H. Pennoyer, of Attleboro, Mass., presented a paper on "Progress and science of community fellowship," better known as the "Attleboro plan." The last paper of the session was by the secretary, on "Germany's economic reconstruction," based on recent investigation and extended consideration of the various social and economic problems demanding early solution, concerning which Dr. Hoffman pointed out that in his judgment there was an alternative or an international administration of the government of the German people.

It is planned that the papers for the next year's session of Section K will be grouped under the general title, "Urgent problems of western civilization."

The Metric Association

President, George F. Kunz.

Secretary, Howard Richards, 156 Fifth Ave., New York City.

(*Report compiled by the permanent secretary*)

The Metric Association held two sessions on Friday, and the metric dinner occurred Friday evening. The papers were devoted to pointing out the numerous advantages of the metric system and the ease with which it may replace the more ancient systems now in use in America. Elwood Haynes, president of the Haynes Automobile Company, advocated the use of the metric system for cooking, carpentry, etc. Theodore H. Miller, works manager of the DeLaval Separator Company, in whose plant the metric system has been in practical use since 1910, pointed out that "the cost of making the change, if made in the right way, is altogether trifling." Dr. Harvey W. Wiley said that our present methods of measuring commodities is unnecessarily complicated and cumbersome. "The abandonment of our own obsolete system would be another forward step in the repression of fraud."—The following officers for 1924 were elected: *President,* George F. Kunz; *vice-presidents,* Theodore H. Miller, Arthur E. Kennelly and W. P. Dobson; *secretary,* Howard Richards, 156 Fifth Ave., New York City; *treasurer,* Frederick L. Roberts.

SECTION L (HISTORICAL AND PHILOLOGICAL SCIENCES)

The work of Section L is divided among three committees at present: (1) The Committee on the History of Science, (2) the Committee on the Philological Sciences in the Association and (3) the Committee on Auxiliary Language. During the period of organization of the philological sciences in the system of the association the Committee on the History of Science is temporarily the section committee for Section L, but the three committees named above are quite autonomous in their respective fields. Each committee presented a program at Cincinnati, reports of which are given below.

Program by the Committee on History of Science

Chairman, Florian Cajori.

Secretary, Frederick E. Brasch, Department of Terrestrial Magnetism, Carnegie Institution of Washington, Washington, D. C.

(*Report by Frederick E. Brasch*)

The Saturday forenoon session on The History of Science was devoted mainly to the very prominent part played by Cincinnati in astronomy, terrestrial magnetism and meteorology. Dr. W. Carl Rufus, of the University of Michigan, dealt with the early history of American astronomical observatories, with special attention to the Cincinnati Observatory, founded in 1843—five years before the organization of the A. A. A. S. The cornerstone was laid by President John Quincy Adams, when he was 76 years old, who made the then very arduous trip from Boston for the purpose. The first director of this pioneer observatory, Ormsby McKnight Mitchell, was a leading astronomer of his period. He founded the first astronomical society and the first astronomical journal in America. Dr. Louis A. Bauer, Director of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, a graduate of the University of Cincinnati, delivered an address on the early history of terrestrial magnetism in America. A leader in the early days of this science was Dr. John Locke, a Cincinnatian who was among the organizers of the A. A. A. S. in 1848. He contributed largely to the study of magnetic dip and intensity and proposed that Cincinnati be made the center of reference for a magnetic survey of the United States. Locke's most important work was the invention of the chronograph (first known as "automatic clock register") for which he received an award from Congress.

Dr. W. J. Humphreys, of the U. S. Weather Bureau, gave an inspiring account of the early history of American meteorology, pointing out that the true beginning of the U. S. Weather Bureau was made in Cincinnati. Dr. Cleveland Abbe, then director of the Cincinnati Observatory, began to issue weather predictions in 1868. Abbe was subsequently a very prominent worker in the Weather Bureau and took part in all lines of meteorological advance. Professor Edwin W. Schreiber, of Proviso High School, Mayfield, Illinois, contributed an illustrated paper on "Drawing Instruments of Two Hundred Years Ago." Special attention was directed to Edmund Stone's edition of M. Bion's work on "The construction and principal uses of mathematical instruments," 1723. Dr. Florian Cajori's address as retiring chairman was omitted, because of lack of time.

The Monday afternoon program was arranged jointly with the Philological Committee and was devoted to a symposium on Lord Francis Bacon's scientific writings, with special reference to celebrating the three hundredth anniversary of the publication of his "De Dignitate et Augmentis Scientiarum." Five papers dealing with the activities of Bacon as the originator of modern scientific methods were read and discussed before an interested audience. Professor Mark H. Liddell, of Purdue University, outlined a college of research projected by Bacon, but never realized. Professor Harry E. Earnes, of Smith College, developed the historical setting of Bacon's work. It was interestingly brought out that, while there were many bright lights in the period that we consider as the Dark Ages, the Renaissance and the Reformation, yet the general intellectual plane of Bacon's day was that based on Aristotle and Plato. Research was generally unknown and Bacon's turning to the experimental method for seeking truth—the observation of particulars in their regular series and order—blazed the way for the development of modern science. Professor W. A. Crowley, of the University of Cincinnati, outlined the practical value of Baconian induction, and was followed by Professor Louis T. More, of the University of Cincinnati, with an interesting paper on Philosophical limitations of modern science. Professor More called special attention to a very prevalent tendency to take evidence at second hand and assume as proved principles whose logical basis is questionable. The session closed with a paper by Dr. Florian Cajori, of the University of California (Chairman of the Committee on the History of Science), summing up some modern applications of Baconian method.

It was announced that plans are being formed for a History of Science society. Dr. David Eugene Smith, of Columbia University, can supply information regarding these plans.

Program by the Committee on Philological Sciences

Chairman, W. A. Oldfather.

Secretary, Mark H. Liddell, Purdue University, LaFayette, Ind.

(*Report by Mark H. Liddell*)

A special invitation conference of leading American philologists on philological sciences was the main feature arranged for the Cincinnati program in that field. A program of representative invitation papers was planned as an introduction to the conference. The Monday forenoon session was called to order by the chairman of the Committee on Philological Sciences and, after a spirited discussion of the aims of the American Association for the Advancement of Science and the objects of the present conference, two papers were presented, one on the present aspects of research in Indo-European philology, by Professor E. Prokosch (of Bryn Mawr College), and the other on problems of the American-Indian languages, by Professor Leonard Bloomfield (of Ohio State University). The latter paper emphasized the importance of preserving the fast-disappearing evidence of these tongues. On motion of Professor Craig, the conference then adjourned to meet at 2 o'clock.

The afternoon session was devoted to a conference on philological subjects. Professor Tom Peete Cross, of the University of Chicago, called especial attention to the importance of Celtic philology in American scholarship and to the need for better facilities for the study of Celtic texts, especially Irish and Welsh dictionaries. Professor E. H. Sturtevant, of Yale University, dealt with the processes forming the basis of phonetic law. Professor L. J. Paetow, of the University of California, called attention to the great need for a modern scientific dictionary of Medieval Latin, not only for Latin philology, but as a necessary tool for the scientific study of the Romance Languages, and for the intelligent appreciation of the history of science as formulated for centuries in the connotations of a Medieval Latin vocabulary. Professor R. G. Kent, of the University of Pennsylvania, then discussed idiom in Esperanto, pointing out the uncertain values of syntax in such artificial languages. Professor G. M. Bolling, of Ohio State University, emphasized the need of better facilities for linguistic study in Greek, and the chairman added specifically the need of a Greek onomasticon and a corpus of Ostraka. A number of elaborate projects covering the entire field of English philology were then presented by Professor Hardin Craig and Professor Knott, of the University of Iowa, after which it was moved and carried that the committee in charge of the present program be directed to report upon the most necessary and practicable of these and other projects at the Washington meeting next year.

The conference session was continued on Tuesday morning with a paper on the importance of research in Scandinavian by Professor George T. Flom, of the University of Illinois. Then followed a discussion of Ido as an International auxiliary language, and a project was presented by Dr. F. G. Cottrell, of the Fixed Nitrogen Research Laboratory of the American University, for a phonetic laboratory with mechanical equipment for the study of speech.

Those present at the conference voted their thanks to the American Association for the Advancement of Science for its interest in philological sciences and recommended that the present Special Committee on Philological Sciences in the association be continued with the request that it prepare a suitable program to represent this field of science at the next annual meeting (in Washington), and that it make recommendations to the association council at that meeting or earlier, in regard to the desirability of taking steps to form a subsection of Section L or a special section of the association on linguistic sciences.

Program by the Committee on International Auxiliary Language

Chairman, S. W. Stratton.

Acting Secretary, F. G. Cottrell, Fixed Nitrogen Research Laboratory, American University, Washington, D. C.

(*Report by F. G. Cottrell*)

The work of this committee since its last formal report to the council of the association was embodied in a report by its chairman, presented as the opening paper of the Saturday morning session devoted to international auxiliary language. The report points out the rapidity with which interest in the subject is growing and particularly the extent to which business, educational and government bodies are coming to put it on their programs as a serious subject for discussion and research. It is planned that the report will appear in a later number of SCIENCE. The presentation of the report was followed by four papers dealing with the auxiliary-language problem in general and with its relation to Esperanto, Ido, Simplified English, *a priori* languages and Latin. The discussions were carried over into an afternoon session and a talk on the subject was broadcasted by one of the speakers the same afternoon from the Radio Station WLW. On the evening of January 1 another talk on the Association's activities in international auxiliary language and the growing importance of this subject to radio communication was broadcasted from Station WSAI, Cincinnati.

In addition to these Saturday sessions, which were directly under the auspices of this committee, the Committee on Philology included in its program of Monday and Tuesday two papers bearing on the auxiliary language problem: one on "Idiom of Esperanto," by Professor Roland G. Kent, of the University of Pennsylvania, and the other an abstract of a discussion between Dr. Max Talmey, of New York City, and René de Saussure, of Bern, Switzerland, on the logical basis of word formation in Ido on the one hand and Esperanto on the other.[1] Cooperation of the Committee on International Auxiliary Language with the Committee on Philology and Section K (Social and Economic Sciences) are being planned for the coming year.

The National Association of Teachers of Speech

President, Harry B. Gough.

Secretary, Henrietta Prentiss, Hunter College, New York City.

(*Report by Henrietta Prentiss*)

The eighth annual meeting of the National Association of Teachers of Speech was held in the Hotel Gibson on Thursday, Friday and Saturday. The attendance included 130 members of the society and their friends. There were represented in the conference, teachers of public speaking and debate, interpretation, dramatic phonology, phonetics and speech correction, but there were no separate programs arranged for these various interests because of the fundamental problems common to all. Eighteen papers were read with different points of view—historical, educational, experimental. It is encouraging to note the increasing number of graduate courses in dramatics, speech and voice, offered in American universities, and the increasing emphasis laid on the laboratory method of research,—Opportunity for group meetings was given after each session. Unusual interest was shown in debating. There is a marked tendency away from the older, more rigid forms and toward the forum type of discussion. On Friday evening the association had the privilege of seeing a practical and highly successful experiment in the socializing powers of dramatics. James Watt Raine, of Berea College, Kentucky, read a paper on "Dramatizing our common life," and students of Berea College gave very successfully three dramatic episodes as illustrations.

The following officers for 1924 were elected: *President,* W. S. Kay, University of West Virginia; *vice-presidents,* B. C. Van Wye, University of Cincinnati; Miss M. B. Echsan, Vassar College; D. Watkins, Uni-

[1] Dr. Talmey's papers have already appeared in print: *American Medicine,* New Series, Vol. XVIII, No. 8, pp. 563–574, Aug., 1923, and *Scientific Monthly,* Vol. XVII, No. 4, pp. 342–360, Oct., 1923. Dr. De Saussure's reply is expected soon to appear in print, probably in the *Scientific Monthly.*

versity of California; *secretary,* Miss F. V. Shattuck, Iowa State College; *treasurer,* R. K. Immel, University of Michigan; *editor,* John Dolman, University of Pennsylvania; *member of council,* W. H. Davis, Bowdoin College (to succeed P. M. Hicks). The arrangements made by the local committee, of which B. C. Van Wye was chairman, were excellent, and sincere appreciation of his labors was expressed. A vote of thanks was tendered to the American Association for the Advancement of Science, through whose courtesy the National Association of Teachers of Speech enjoyed the privilege of being an official guest of the American Association.

SECTION M (ENGINEERING)

Vice-president and chairman, John T. Faig.
Retiring vice-president, F. M. Feiker.
Secretary, L. W. Wallace, 26 Jackson Place, Washington, D. C.

(*Report by L. W. Wallace*)

Section M held two sessions, one Friday morning and one in the afternoon, which were well attended, about 125 being present in the morning and 150 in the afternoon. Interest was great and discussion was active. The admirable address of the retiring vice-president, F. M. Feiker, dwelt upon the place of the engineer in public life and stressed the thought that the engineer is dependent upon the work of the pure scientist. The address will be published. John Mills, of the Western Electric Company, gave an address on "The atom—what it means to the engineer." He explained the modern theory of atom formation and organization. He aroused a great deal of interest in the subject, and inquiries were made as to what books one should use in this subject. Mr. Mills's discussion, because of its clarity and scope, was a real contribution. Charles F. Kettering, of the General Motors Research Corporation, disclosed in a very fascinating and illuminating manner the relationships between the several branches of science. He emphasized the definite relationship between science and enginering, pointing out that all branches of knowledge deal with the fundamentals of mass and energy. He expressed the need for a standard nomenclature for these fundamentals as essential to scientific and engineering progress. Mr. Kettering's wish that greater intelligence should be fostered regarding the forces of nature in general to the end that opinion and fact may be more clearly distinguished, is shared by scientific workers in all fields. Ernest L. Robinson, of the General Electric Company, presented a most lucid paper on the utilization of products of combustion. His discussion started with a consideration of the Carnot and Rankine cycles and then traced the changes that have been made in steam generating and utilizing units in an endeavor to approach more fully the theoretical usage set forth as an ideal in the Carnot cycle. His paper is particularly noteworthy as a summary of progress in that direction. Dr. Sanford A. Moss, of the General Electric Company, presented a discussion of the gas turbine and made a real contribution. Much credit is due to Vice-president Faig for having arranged such an inspiring and generally successful program and for the charming way in which he contributed to the pleasure of the sessions. It is his thought that Section M may serve an important end by seeking to interpret for engineers the recent developments in the related sciences. The papers presented at this session fulfilled that mission admirably.

SECTION N (MEDICAL SCIENCES)

Vice-president and *chairman,* Richard P. Strong.
Retiring vice-president, Francis Weld Peabody.
Secretary, A. J. Goldfarb, College of the City of New York, New York City.

(*Report by A. J. Goldfarb*)

The Cincinnati sessions of Section N were the most successful of any in recent years, specially notable for the very high character of the papers presented and the distinction of the speakers, and for the maintained lively interest of the audience, who took unusually active part in the discussions. Professor Francis W. Peabody, of Harvard University, in his retiring vice-presidential address gave a lucid account of the uniquely useful rôle that Section N aims to play in an age of increasing specialization and the partial intellectual isolation that must inevitably come with specialization among workers in science. The section aims to bring together at its sessions specialists in the fields where medical science makes contact with the fundamental sciences and with special lines of study that are not primarily medical but have pronounced relations to certain aspects of medical science. Dr. L. O. Howard, of the U. S. Bureau of Entomology, gave a most interesting account of Dengue fever in the southern United States. Characterized by low mortality and high morbidity, this fever is spread by the house-mosquito and may be controlled by systematic operations against that insect. Dr. Howard also gave a delightful illustrated account of European stations dealing with tropical diseases, including the men of these stations and the nature of their work. Dr. Richard P. Strong, of Harvard Medical School, gave a scholarly account of part of his recent studies in Central America, dealing with the discovery of a flagellate protozoan parasite in the latex of plants, which passes through successive stages of parasitism in a hemipterous insect, a lizard, and at length becomes the cause of disease in various mammals. This paper was followed by a well-studied

presentation of the history of parasitology by Professor Henry B. Ward, of the University of Illinois.

A symposium was devoted to the endocrines. Professor Thomas R. Sprunt, of the Johns Hopkins University, spoke of difficulties that beset an internist who tries to sort significant observations from a confusing array of symptoms, to separate facts from the chaos of myth, pseudo-facts and ignorance that is associated with endocrinology. A paper by Professor George W. Crile, of Western Reserve University, read by his colleague, Dr. Laver, dealt with changes in electrical conductivity in brain and liver and heat changes, associated with endocrine variations. Professor R. E. Hoskins, of Ohio State University, editor-in-chief of *Endocrinology,* gave a masterly discussion of what is and what is not in this field. Merciless toward pseudo-science, his treatment was encouraging and stimulating toward the further evolution of this difficult but fundamental line of work. It was said by those who should know that Professor Hoskins's paper was the clearest, most scientific and most satisfying presentation of endocrinological science thus far produced in English. Professor J. J. R. Macleod, of the University of Toronto, gave a closely reasoned and altogether delightful discussion of the history of insulin. He showed that many minds have contributed to our present knowledge of this wonderful agent. He described the painstaking efforts of Banting to secure a product that would not produce injurious symptoms in the patient. He pointed out the steps that are being taken to remove the other characters of diabetes, aside from the control of sugar in blood and urine. He dwelt on the peculiar problems of glycogen storage and suggested the probability of the existence of another hormone, separate from insulin and influencing fat metabolism. The problem of the regeneration of the islets of Längerhorn, when the ravage of the disease has been halted by insulin treatment, was also considered. An interesting point came out in the discussion, that, had the present laws of Ohio on the capture and killing of all stray dogs and cats been in force in Toronto, the discovery of insulin could not have taken place as it did.

The American Student Health Association

President, Joseph E. Raycroft.

Secretary-treasurer, Warren E. Forsythe, University of Michigan, Ann Arbor, Mich.

(*Report by Warren E. Forsythe*)

The American Student Health Association held a meeting with the American Association for the Advancement of Science for the first time this year. The Cincinnati meeting was the most successful in the history of the American Student Health Association, characterized by great freedom of discussion and very valuable comparing of notes. There were five sessions, attended by 25 persons keenly interested in methods and results of work directed toward the health of students in educational institutions. The following notes may give an idea of the discussions. Dr. C. W. Goddard reported an admirable system of supervision of sanitation at the University of Texas. Dr. J. E. P. Holland reported experience with a sharp epidemic of diphtheria at the University of Indiana. Dr. H. S. Diehl presented results in the employment of physicians for dispensary and hospital work on full and part-time bases. Dr. Richard Kimpton presented a strong case for the necessity of very careful eye examinations to preserve the efficiency of college and university students. Dr. J. E. Raycroft gave a strong plea for proper evaluation of student-health work in several particulars. The most interesting discussion resulted from a symposium on the responsibilities and opportunities of health departments for the supervision of athletics, athletes and the care of athletic injuries. It was revealed that Harvard University has a very effective system whereby the physician is in complete control of all matters that have any relation to the health of participants in teams and games. A similar system was reported at Yale.

SECTION O (AGRICULTURE)

Vice-president and *chairman,* R. A. Pearson.

Retiring vice-president, R. W. Thatcher.

Secretary, P. E. Brown, Iowa State College, Ames, Iowa.

(*Report by R. W. Thatcher*)

Section O held joint sessions at Cincinnati with the American Society of Agronomy, as shown below. The address of the retiring vice-president for Section O was given at the agricultural scientists' dinner Friday evening, by Dr. R. W. Thatcher, director of the New York Agricultural Experiment Station, Geneva, N. Y. His topic was "A program for agricultural development."

The American Society of Agronomy

President, M. F. Miller.

Secretary, P. E. Brown, Iowa State College, Ames, Iowa.

(*Report by R. W. Thatcher*)

Two sessions on Friday, held jointly with Section O, were devoted to a well-attended symposium on "Research fundamental to the solving of economic problems of crop plants." The subject was discussed from seven different viewpoints, by as many speakers, as follows: Taxonomy, Dr. C. R. Ball, of the U. S. Department of Agriculture; Mycology, Dr. C. L.

Shear, of the U. S. Department of Agriculture; Morphology, Dr. R. A. Oakley, of the U. S. Department of Agriculture; Physiology, Dr. William Crocker, of the Thompson Institute for Plant Research; Cytology, Dr. R. A. Harper, of Columbia University; Genetics, Dr. H. H. Love, of Cornell University; Biochemistry, Dr. R. A. Gortner, of the University of Minnesota; Soils, Dr. R. G. Lipman, of the New Jersey Agricultural Experiment Station. It was generally expressed that there is great need for scientific studies bearing on the practical problems of agriculture and that economic plants may well be chosen as experimental and observational subjects for fundamental research in biological science.

The American Society for Horticultural Science

President, J. H. Gourley.

Secretary, C. P. Close, College Park, Md.

(*Report by C. P. Close*)

The society held sessions on Thursday, Friday and Saturday, with very good attendance. In spite of a full program, there was generally good discussion of the papers presented and interest was maintained at a high level. The address of the retiring president, Professor J. H. Gourley, of the Ohio Experiment Station, Wooster, Ohio, was given on Saturday afternoon. He presented a most instructive paper on the development of American horticulture during the last seventy-five years. The period was conveniently divided into three eras. The era of the amateur (ending about 1870) included the work of such remarkable pomologists as A. D. Downing, Charles Downing, Elwanger, Fuller, Henderson, Hovey, Longworth, Meehan, Warden and Wilder. The agricultural colleges were established by the Morrill Act in this era and some of the best of the present varieties of fruits originated. The era of fruit testing (from about 1879 to about 1900) saw the development of field experimental work, the establishment of the state experiment stations by the Hatch Act, and the organization of the Division of Pomology in the U. S. Department of Agriculture. Commercial fruit growing and the use of cold storage for fruits developed rapidly. Spraying was introduced and became general. San Jose scale, Colorado potato beetle and codling moth appeared. The bacillus of pear fire-blight was discovered. Many of the present commercial varieties of fruits were introduced in this era. The last era is specially marked for great development of commercial fruit growing and for the organization of research under the Adams Act and of extension work under the Smith-Lever Act. The development of cooperative marketing and the wide introduction of power sprayers have been prominent in this period and the science of genetics has developed.

A symposium of short papers on landscape demonstration, to encourage farmers in the beautifying of their home grounds, occurred on Thursday afternoon. One speaker reported great success in conducting "planting bees" at school houses. After the symposium other papers on extension and teaching were presented. A need for a nation-wide conference on horticultural teaching, research and extension was discussed and a full discussion of these topics is planned for the next meeting, in Washington. There were two sessions for papers on fruits, one for papers on vegetables and one for papers on nursery stock. The symposium on crown gall, arranged jointly by the Phytopathological Society, the Society for Horticultural Science and other groups, was very successful; it has been reported above, for the Phytopathological Society.

The Potato Association of America

President, W. H. Martin.

Secretary-treasurer, William Stuart, U. S. Department of Agriculture, Washington, D. C.

(*Report by Wm. Stuart*)

The tenth annual meeting, held Thursday, Friday and Saturday, was the most successful in the history of the association. It was reported that membership had increased by seventy per cent. in 1923. The report of the committee on research was very valuable, as was also that of the committee on nomenclature. An exhaustive report on seed improvement and certification was submitted late in the meeting but could not be discussed because of lack of time. A session was devoted to potato fertilizers and there was a symposium on potato grading and marketing. A symposium on potato-scab control was perhaps the most interesting. It appears that the problem of scab control is still unsolved for many soil types but that flowers of sulphur—especially the inoculated material—has been generally effective for the Sassafras loams of New Jersey. A historical summary of certain features of the potato industry, for the last seventy-five years, was presented by William Stuart. During that period the outstanding events were said to be: Development of a distinct American race of potato varieties; development of disease-control methods, especially of Bordeaux mixture; development of horse-drawn planters and diggers; production of high-grade seed-potatoes; disinfection; use of chemical fertilizers; study of virus diseases; group classifications; and variety standardization.

The association adopted two resolutions, one favoring a carefully restricted potato acreage for the northern United States in 1924 and one expressing sincere appreciation on the part of the Potato Association, of the numerous courtesies received from the American Association for the Advancement of Sci-

ence, especially of the excellent services performed by the local committee for the Cincinnati meeting, which made this meeting a most profitable and successful one to the members and guests of the Potato Association.

The Association of Official Seed Analysts

President, F. W. Taylor.

Secretary, A. L. Stone, University of Wisconsin, Madison, Wis.

(*Report by A. L. Stone*)

The meeting of the seed analysts was one of the best ever held, measured by the importance of the subject-matter presented in the papers, by the excellent results of the associational work as shown by the committee reporters, and by the constant and live interest in the discussions. One individual who attended meetings of some of the other organizations remarked that the interest shown and the "pep" injected into the meeting surpassed anything he had seen elsewhere. The meeting lasted from Thursday to Saturday. The president's annual address, on "Seventy-five years of agricultural progress," was a masterly presentation, in which he traced the changes that have taken place in production, transportation and marketing of crops, and emphasized the great part played in this advance by national and state educational agencies. He remarked that recent progress in agriculture is probably not equalled in any other industry, unless it be in that of war. Some interesting illustrations showed recent agricultural progress in an original manner. Seventy-five years ago it required four hours and thirty-one minutes of human labor, on the average, to produce a bushel of corn; now it requires only forty-one minutes. A bushel of wheat is now produced by only ten minutes of human labor; seventy-five years ago it required three hours. Last summer our farmers cut and cared for about fifty million acres of grass, probably in about ten days on the average, so that about five million acres were cared for per day. To have handled such a hay crop in ten days, by the methods in vogue when Millard Fillmore was president, would have required the services of nearly four times the number of men enlisted in the American army during the World War. In the last seven decades the number of farm workers in the United States has only about doubled, while the production of corn and oats has been multiplied by five, that of wheat by eight and that of pork and hay by one hundred. The program as a whole was of great interest to the analysts and seedsmen present. The most outstanding feature was the report of the Committee on Research and Methods, including the referees on seed sampling, purity testing and germination. The report gave the results of a study of equipment in the seed laboratories of the United States and Canada—types and makes of germinators, methods of controlling temperature, etc. It involved also a study of the training and efficiency of the analyst, showing that to be efficient he must be trained in botany, plant physiology, agronomy, pathology, bacteriology and chemistry. He must be careful, painstaking, accurate and courageous, in addition to which he must be an administrator of no mean ability, especially where his duties include the enforcement of law. The committee reported the results of purity and germination tests on a series of samples of various agricultural seeds, where, as nearly as was humanly possible, identical samples were sent to each laboratory belonging to the Association, and to several commercial seed analysts employed by seedsmen. The results were compared. As a result of the work done for the last three years the Association designated certain laboratories as "Certified" on the ground that they were equipped and manned to do accurate and dependable work. The laboratories included in this preliminary certification were Calgary (Canada), California, Colorado, Delaware, Idaho, Indiana, Kentucky, Maryland, Minnesota, Missouri, Montana, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Ottawa (Canada), Texas, Virginia, Washington (D. C.) and Wisconsin. The report of the committee also included the results of a study to discover the possibility of determining the origin of samples of agricultural seeds by the weed seeds and other material contained in them. This appears to be possible.

An interesting feature of the meeting was an illustrated address by Dr. William Crocker, of the Thompson Institute for Plant Research, on "Principles of seed germination as illustrated by the behavior of Johnson grass and Amaranthus seeds." It appears that delayed germination in these seeds is not due to hardness of seed-coat nor to dormancy of the embryos in the usual sense. Complete removal of the coat resulted in rapid and nearly complete germination, although the seed-coat did not appear seriously to hinder water entrance.

The Geneticists Interested in Agriculture

Secretary ad interim, E. W. Lindstrom, Iowa State College, Ames, Iowa.

(*No report received*)

SECTION Q (EDUCATION)

Vice-president and *chairman,* Henry W. Holmes.

Retiring vice-president, Bird T. Baldwin.

Secretary, A. S. Barr, 1924 Hazlewood, Detroit, Mich.

(*Report by A. S. Barr*)

Five well-attended sessions of the section were held, on Thursday afternoon and on Friday and Saturday forenoon and afternoon. The address of the retiring

vice-president, Dr. Bird T. Baldwin, of the Iowa Child-Welfare Research Station, Iowa City, Iowa, was delivered Thursday afternoon, on "Cooperative research in education." The speaker outlined important features in the work of the Iowa Child-Welfare Research Station, established by the Iowa Legislature in 1917 for the scientific study of the development and conservation of normal and superior children. Four lines of work were reviewed: a study of the relation of physical growth to adolescence in boys, a study of the relation of mental to physical growth, a three-year investigation of the rural child in Iowa, and services as scientific consultant for the city schools of Cleveland. Besides the vice-presidential address were given in the same session an invitation paper on repeated measurements of mental and physical development of school children, by Dr. Walter F. Dearborn, of Harvard University, and another on the scientific method applied to the study of the social objectives of education, by Dr. C. C. Peter, of Ohio Wesleyan University. Dr. Dearborn spoke of a study of the ossification of carpal bones by means of X-ray photographs. A monograph on some of the results of this study has recently been published, on "The determination of anatomical age in school children and its relation to mental development." Important age, sex and racial differences in growth have been shown. Dr. Peter emphasized a need for a more scientific method in curriculum construction. He said we should first determine the various needs that life presents (by systematic job analyses, with attention to notable failures and successes), after which we should find out which of these needs require the help of the school, and these should be considered in planning the school curriculum.

The Friday forenoon session was devoted to invitation papers on scientific methods as applied in preschool training, in elementary, secondary and college education, and in teacher training. The Friday afternoon session was held jointly with the Phi Delta Kappa Fraternity (see, below). The Saturday forenoon session included papers on scientific methods in individual development, in educational finance, in planning school buildings, in educational supervision, in instruction, and in educational administration. The afternoon session of the same day was devoted to miscellaneous papers on a plan for securing ratiocratic control of educational policies, curriculum building in arithmetic, results of repeated intelligence tests, an experimental study of patterns of thought and materials of educational sociology.

The Phi Delta Kappa Fraternity

President, William S. Gray.

Secretary, Abel J. McAllister, 2118 West 109th St., Chicago, Ill.

(*Report by A. S. Barr*)

The fraternity held a session jointly with Section Q on Friday afternoon. Dean J. Manhan, of the University of Virginia, discussed the "Case method of school supervision." Professor Fred Ayer, of the University of Washington, reviewed the scientific methods of biology and through a clever analogy discussed the "Morphology of the school curriculum." Dr. S. A. Courtis, of the Detroit Public Schools, made a strong plea for the strict application of the law of the single variable in attempts to secure accurate educational measurements.

ORGANIZATIONS RELATED TO ALL SECTIONS OF THE A. A. A. S.

The Society of Sigma Xi

President, Henry B. Ward.

Secretary, Edward Ellery, Union College, Schenectady, N. Y.

(*Reported by Edward Ellery*)

Sigma Xi held its twenty-fourth annual convention at Cincinnati. At the business session, Friday afternoon, charters were granted for chapters in the University of Virginia, the California Institute of Technology and the Johns Hopkins University. It was voted that sets of the Sigma Xi Quarterly be deposited in the libraries of institutions where there are chapters, in the Library of Congress and in prominent state libraries. The Alumni committee appointed at the last annual convention was represented in the present convention, as well as in the meeting of the executive committee. This representation of the alumni among the officers of the society marks a new departure and promises greater usefulness of Sigma Xi in promoting the cause of research. The following officers were elected: *President,* F. K. Richtmyer, Cornell University; *secretary,* Edward Ellery, Union College, Schenectady, N. Y.; *treasurer,* George B. Pegram, Columbia University; *executive committee,* Carl H. Eigenmann, George W. Stewart, Clarence E. McClung, Vernon Kellogg and Henry B. Ward; *alumni representative,* Clarence E. Davies. The annual dinner, held Friday evening, in the Commons of the University of Cincinnati, was the occasion of brief addresses by President F. C. Hicks, of the University of Cincinnati, and others.

The second Annual Sigma Xi Lecture, under the joint auspices of the American Association and Sigma Xi, was delivered on Friday evening in the auditorium of Hughes High School, by Dr. Willis Rodney Whitney, of the General Electric Company. His subject was "The vacuum, there's something in it." This address has been considered in these reports, under General Sessions. Dr. Whitney was assisted by Dr. C.

W. Hewlett and Mr. A. B. Page, both connected with the research laboratory of the General Electric Company.

Other Organizations

The Societies of Gamma Alpha, Phi Kappa Phi and Sigma Delta Epsilon were scheduled to hold meetings with the American Association for the Advancement of Science at Cincinnati during convocation week, but no response has followed the permanent secretary's requests for reports of their meetings.

THE ORGANIZATION, WORK AND PURPOSES OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

GENERAL SCOPE

The American Association for the Advancement of Science aims to advance science in the New World in every feasible way. The majority of its members and all the societies now associated with it are of the United States or Canada, but its field is not limited to those two countries and it has members residing in all parts of the world. All who are interested in the progress of knowledge and education are eligible to membership. Its organization presents two aspects:

(1) It constitutes a cooperation of many thousands of individuals for the advancement of science and all that this phrase implies. At the opening of the Cincinnati meeting the membership list included 12,015 names. Its membership represents persons engaged in scientific or educational work or appreciating the value of these lines of activity. The individual members of the association support its project through financial contributions, which may have the form of *sustaining-membership* contributions, *life-membership* contributions, *annual membership* dues, or *associate-ship* dues. Contributions of the last two forms are used directly to support the work of the association, while only the income from the first two forms of contribution is thus used, these contributions themselves being permanently invested and very carefully guarded.

(2) The association is also a great general organization of eighty-three wholly autonomous and independent *associated* scientific societies and twelve local academies of science and learning. Forty-three of the larger associated socieites and all the associated academies are officially *affiliated* with the association. Affiliated societies have representation in the association council and in its section committees, thereby takng part in the control of its affairs. Whether affiliated or not, the associated societies have no responsibility for the financial support of the organization, which is borne, as has been said above, solely by the individual members. A list of the associated societies is presented farther on in this issue of SCIENCE.

The association aims to assist, in every feasible way, the work of all men and women of science and that of all scientific and educational organizations, especially those that are associated with it. A large number of the latter regularly meet at the times and places of the association meetings, while many others frequently do so. The facilities of the association, for arranging sessions, etc., are at the disposal of all the societies that meet with it at any of its meetings. Reduced railway rates for the meetings are generally secured. To individual members the organization is valuable in many ways, especially through its publications and through the meetings. The permanent secretary's office is always ready to aid the scientific work of members in every way possible. It is hoped that all members and all associated societies may realize that the American Association for the Advancement of Science is *their* association, and that they will continue to demand of its officers more and better work for the growth of knowledge, for increased popular appreciation of science and the scientific method of thought, and for the improvement of democratic civilization in general. It is also hoped that both the societies and the individual members will enter fully into the spirit of cooperation with the section secretaries, with the permanent secretary's office, and with the other offices and committees of the association, to the end that the services of the association may be still further broadened, its prestige may be still further enhanced, and its power may be still further strengthened, "to give a stronger and more general impulse and more systematic direction to scientific research, and to procure for the labors of scientific men increased facilities and a wider usefulness."

ORGANIZATION

The direction of the association rests in the council, a democratically constituted body that combines the legislative and executive functions. The council consists of the president, the vice-presidents (at present 15 in number), the treasurer, the general secretary, the permanent secretary, the secretaries of the sections (now 15 in number), the council representatives of the affiliated societies and academies (43 societies and 12 academies, with 87 representatives altogether), and eight elected members. All council members, execpting the representatives of societies and academies, are elected by the council itself, for it nominates and elects the president, the general and permanent secretaries, the treasurer and the eight additional elected members, and it elects the vice-presidents and section secretaries on nominations by the respective sections. There are 137 council memberships at present, but

the same person sometimes serves in more than a single capacity, and there are now 127 names on the council roll. A list of the council members for 1923 has been presented on earlier pages of this issue of SCIENCE. The council meets regularly four or five times during each annual meeting, and interim business is transacted by the executive committee of the council, which consists of the president, the general secretary, the permanent secretary and eight other members elected by the council. The executive committee for 1923 consisted of Simon Flexner, *chairman;* Charles D. Walcott, *president;* D. T. MacDougal, *general secretary;* B. E. Livingston, *permanent secretary;* J. McK. Cattell, H. L. Fairchild, L. O. Howard, W. J. Humphreys, A. A. Noyes, Herbert Osborn and H. B. Ward. For 1924 the personnel remains the same, with the exception that Dr. Walcott is succeeded by Dr. Cattell, the president-elect; Dr. A. A. Noyes is succeeded by Dr. W. A. Noyes, and Dr. G. A. Miller takes the place left vacant by Dr. Cattell's election as president.

The association has fifteen sections, representing the main current subdivisions of science, and each is designated by a letter, as follows: A (Mathematics), B (Physics), C (Chemistry), D (Astronomy), E (Geology and Geography), F (Zoological Sciences), G (Botanical Sciences), H (Anthropology), I (Psychology), K (Social and Economic Sciences), L (Historical and Philological Sciences), M (Engineering), N (Medical Sciences), O (Agriculture), Q (Education). Members of the association may be enrolled in one or more sections and a card file of its members is maintained for each section. Section P is planned for Manufactures and Commerce, but has not yet been organized.

ACTIVITIES

The activities of the association are, in general, of three kinds, those related to the holding of the annual and other meetings, those related to publications and those related to the advance of knowledge by research. These may be briefly considered in order.

Meetings

The regular annual meetings are made possible by the organization of the association. A local committee for each meeting has charge of all local details. These meetings are the only large gatherings of the kind that include all branches of science. They present to the people an orderly exposition of all the branches of American scientific thought. These, and the other meetings that are occasionally held, constitute a powerful means of disseminating knowledge, of cultivating the scientific attitude of mind and of promoting a general appreciation of the great importance of science and scientific study. For each meeting the association organizes a publicity service, which gives to the daily press authoritative accounts regarding science. The meetings also furnish the only means by which such a large number of active workers in all branches of science are brought together from distant regions, with consequent opportunities for the formation and renewal of numerous personal acquaintanceships and friendships.

When an associated society meets with the others of the group all its needs are cared for through the organization of the association. In these cases the society officers are freed from most of the preliminary work that must always be done in preparing for a society meeting. The association does not urge that associated special scientific societies should always meet with the larger group representing all the sciences; there are good reasons why some societies should generally meet at other times and places, and why some should frequently or occasionally do so. This matter is of course decided by each society for itself. But the association does *invite* all scientific societies to meet with it, especially at the greater four-yearly meetings, and it proffers the machinery of its organization for the advantage of all societies that accept this invitation. It asks the officers of societies that meet elsewhere and at other times to consider seriously how they may be able, nevertheless, to aid their respective section committees to present their respective fields of science in an adequate and impressive way, and it asks the council representatives of the societies to take active part in the work of the association. In a great exposition of American scientific work such as one of the annual meeting of the association, as well as in the conduct of association affairs in general, it is surely desirable that the work of every special scientific society should be well represented. In the absence of the associated societies a section committee arranges the program for its field of scientific work; in the presence of the societies the program is mainly left in their hands.

The council aims to select meeting places in such a way as to bring the meetings successively into the various regions of the United States and Canada, in order that all members may frequently attend without too extensive journeys, and that the wholesome local publicity for scientific work and the general educational influences that always result from the meetings may be brought to all quarters of the two countries.

Publications

The weekly journal SCIENCE, official organ of the association, furnishes an open forum for the discussion of questions regarding science and education. Almost every branch of scientific knowledge is represented in its columns. Many shorter scientific contributions of the results of research are published in SCIENCE, which probably has a larger circulation than

any other journal that embraces the entire scientific field.

Since SCIENCE became the official organ of the association for the publication of its official announcements and the reports of its meetings, the annual publication of a volume of proceedings has been discontinued, and volumes of summarized proceedings have been published in their stead. Five volumes of this kind have appeared—the last one in 1921, covering six years. Each of these volumes presents the lists of officers, etc., for each of the years in question, together with references to SCIENCE for the presidential and vice-presidential addresses and other official communications for these years. It also includes the complete membership list as this stood at the date of printing. It is planned to publish the next volume in the fall of 1925.

The membership list of the association forms one of the most valuable instruments of its kind as an address list of American scientific workers and friends of science. Fellows of the association as well as life and sustaining members are specially designated.

From time to time the council of the association has adopted resolutions calling attention to various matters that pertain to the general welfare as this is related to scientific thought and setting forth the position taken by the association in these matters. Such resolutions are published in SCIENCE and are sent to interested persons and organizations.

One of the most important features of the work of the association is the support it gives toward the publication of SCIENCE, and one of its main objects is the publication and wide circulation of this weekly journal. SCIENCE is sent free to all members in good standing. Such members are allowed, however, to receive *The Scientific Monthly* instead of SCIENCE, if they so request. At the beginning of the calendar year a subscription to the journal for that year is ordered from the publishers for each member whose annual dues for the current fiscal year have been paid. As a special accommodation, members who paid dues for the preceding fiscal year are kept on the mailing list of the journal until February 1, even though they may not have paid for the current year. The journal is discontinued on the last-named date unless the current dues have been paid. Those paying their dues still later in the year receive the journal from the time the dues are paid, but, as a special favor, may receive the back issues for the current calendar year *if they so request, provided they pay for the transportation of these back issues at the rate of one cent for each copy.*

The association publishes a preliminary announcement for each meeting, which is mailed to all members. It also publishes a general program for each meeting. Each general program of an annual meeting forms an excellent epitome of the status of American science. General programs may be secured from the Washington office on request if postage (6 cents) is prepaid.

Endowment and Grants for Research

The American association is entrusted with a considerable permanent endowment, which has been derived from gifts and bequests of public-spirited persons and from payments made by sustaining members and life members. The income derived from these funds is employed to advance scientific research. It is annually appropriated for grants, which are made to individuals or scientific organizations, to aid research projects. Applications for financial assistance in scientific investigations are referred to a special committee on grants which considers the applications and apportions the available funds. Recipients of these aids to research make reports to the association, showing how the funds have been expended and the nature of the results obtained.

It is desirable that the endowment of the association be increased whenever possible, and it is hoped that the opportunity thus offered for continuously aiding the increase of useful knowledge may be widely appreciated. All who are interested in the advancement of science by research are urged to bring the existence of this trust fund to the attention of public-spirited and philanthropic men who might become donors, sustaining members or life members of the association. The fundamentally democratic nature of the American association and its broad, general scope constitute an unusual guarantee that funds entrusted to it will be reasonably and efficiently employed in ways calculated to advance science and improve education.

The association offers the most efficient means by which individuals, scientific societies and scientific institutions may unite to hasten the growth of scientific knowledge and to increase public appreciation of what the peoples and nations owe to science and what may be expected of science in the future. The insistent efforts of many individuals and organizations, united in such a comprehensive association for the advancement of learning, is capable of exerting a most powerful influence for good in national and international development.

Cooperation with Other Organizations

Besides the activities mentioned above, the American association cooperates with other organizations for the advancement of learning. Most of the American scientific societies for special fields of science are affiliated or otherwise associated with the association.

A scientific society may become associated with the American association on making application to the

permanent secretary and upon a vote of the council. No special obligations are involved; but when associated societies meet with the association, the local committee attends to their arrangements, their official programs are published in the general program and their members receive the privilege of reduced railway rates whenever these are secured for the meeting. Their names are shown in the official list of associated societies. Scientific societies are encouraged to become associated with the association.

An associated society may become affiliated with the association upon application to the permanent secretary and upon a vote of the council. Affiliated societies are generally societies for the promotion of scientific research, and they have representation in the council of the association and in its section committees, their representatives being chosen from among the fellows of the association. Members of affiliated societies have the privilege of becoming members of the American association without payment of the usual entrance fee, if they make application before the second October 1 following their entrance into the society. When a society first becomes affiliated this special privilege is offered to all its members, the offer being open until the second October 1 following the ratification of the arrangements of affiliation. *For the calendar year 1924, all members of affiliated societies and all who wish to join in the philological work of Section L may enter without paying entrance fees.* Each affiliated society elects one member of the council of the association, and those societies of which one hundred or more members are fellows of the association elect two council representatives.

Two regional divisions of the association are in very successful operation—the Pacific Division and the Southwestern Division. The former includes all association members residing in Alaska, British Columbia, Washington, Oregon, California, Idaho, Nevada, Utah, Mexico (excepting Sonora and Chihuahua), the Hawaiian and Philippine Islands and other islands of the Pacific. The Southwestern Division includes association members resident in Arizona, New Mexico, Colorado, Sonora, Chihuahua and Texas west of the Pecos River. These divisions are autonomous, holding annual and other meetings and engaging in projects for the advancement of science in their respective regions. Their individual members are members of the association and have all the rights and privileges of this membership. Excepting newly elected members, members of a division pay their annual dues to the Washington office, and the division receives one dollar for each payment thus collected. New members of a division pay the entrance fee and the first annual dues to the division. The division retains the entrance fee and sends five dollars (the first annual dues) to the permanent secretary's office in Washington; upon the receipt of this the new member is enrolled and the journal is ordered for him, and one dollar is transmitted to the division secretary.

Local branches of the association are authorized; and one such branch has thus far been formed, the State College (Pennsylvania) Branch. This branch has two kinds of members—national (regular members of the association residing in or near State College) and associate (individuals who take part in the work of the branch but who are not members of the association). The affairs of the branch are mainly directed by its national members; it is autonomous in its local work. The branch receives, for its expenses and to promote its activities, the entrance fees (five dollars each) paid by its new national members and fifty cents for each payment of annual dues made by its national members.

State academies of science, excepting those representing states lying within the region of either of the two divisions, may become affiliated with the association, there now being twelve affiliated academies. This form of affiliation has been planned to promote the growth of the several academies and especially to aid them in making their meeting increasingly successful and locally influential. Affiliated academies receive the entrance fees collected from new association members who are on their membership lists. They also receive one dollar from each payment of annual dues made to the association by their members.

The association cooperates in other ways with its regional divisions and with the affiliated academies to aid in their work of encouraging local interest and appreciation regarding scientific progress.

Many projects for the advancement of science, for the improvement of education and for increased national and international welfare have received the support of the association. Its Committee of One Hundred on Scientific Research, organized early in 1914, formed the beginning of a nation-wide endeavor to accelerate systematic research and to render the knowledge of individuals more readily available to other individuals and to their government and nation. The National Research Council, of the National Academy of Sciences, is now the most prominent national organization for this work in the United States, and the association cooperates with the Research Council in many ways toward the advancement of science and the encouragement of scientific research.

The association has been appreciative of the need for improved facilities for bringing published scientific work to the attention of those who would make use of it—such facilities as abstract journals and other similar aids to research. Financial grants were made to aid the *Concilium Bibliographicum* in its earlier years, and *Botanical Abstracts* was similarly helped at a time when such support was greatly ap-

preciated. Both of these enterprises are now in very promising condition, through assistance secured for them by the National Research Council. For 1923 and 1924 the association has contributed some financial help to the Annual Tables of Physical, Chemical and Technological Data.

The association cooperates with the U. S. National Academy of Sciences and the U. S. National Research Council in the recently founded Science Service whose aim is to disseminate truthful and at the same time readable information about scientific subjects.

It is the aim of the association: To extend its activities in all lines just as rapidly as possible; to make its meetings more efficient and more beneficial; to enlarge the journal and give it a still wider circulation throughout the world, and a farther-reaching influence upon thoughtful people; to become the trustee of increased endowment for scientific research, thereby being able to aid directly in new discoveries and new applications of knowledge.

SOCIETIES ASSOCIATED WITH THE AMERICAN ASSOCIATION

Arranged according to the corresponding sections of the association.

(Affiliated societies are designated by asterisks; a single asterisk denotes one representative in the Council, two asterisks denote two representatives. For the names of the representatives, see the list of Council members, pages 81 to 82.)

A. MATHEMATICS

**The American Mathematical Society.
**The Mathematical Association of America.

B. PHYSICS

**The American Physical Society.
*The American Meteorological Society.
*The Optical Society of America.

C. CHEMISTRY

**The American Chemical Society.
The American Institute of Chemical Engineers.
The American Electrochemical Society.

D. ASTRONOMY

**The American Astronomical Society.

E. GEOLOGY AND GEOGRAPHY

**The Geological Society of America.
The Paleontological Society of America.
**The Association of American Geographers.
**The Seismological Society of America.
**The American Geographical Society.
The National Council of Geography Teachers.
The American Alpine Club.
The Mineralogical Society of America.

F. ZOOLOGICAL SCIENCES

**The American Society of Zoologists.
**The Entomological Society of America.
**The American Association of Economic Entomologists.
*The Eugenics Research Association.
*American Society of Mammalogists.
The Wilson Ornithological Club.

G. BOTANICAL SCIENCES

**The Botanical Society of America.
**The American Phytopathological Society.
The Botanists of the Central States.
The American Fern Society.
The Sullivant Moss Society.

F-G. ZOOLOGY AND BOTANY

**The American Society of Naturalists.
**The Ecological Society of America.
**The American Genetic Association.
**The American Microscopical Society.
The American Nature-Study Society.

H. ANTHROPOLOGY

**The American Anthropological Association.
The Archeological Institute of America.
The American Folk-Lore Society.

I. PSYCHOLOGY

**The American Psychological Association.
The Southern Society for Philosophy and Psychology.

K. SOCIAL AND ECONOMIC SCIENCES

The American Civic Association.
The American Economic Association.
The American Association for Labor Legislation.
The Metric Association.
The American Sociological Society.
The American Statistical Association.

M. ENGINEERING

**The American Society of Mechanical Engineers.
**The American Institute of Electrical Engineers.
**The American Institute of Mining and Metallurgical Engineers.
**The American Society of Civil Engineers.
**The Illuminating Engineering Society.
*The American Society for Testing Materials.
The American Society of Heating and Ventilating Engineers.
The American Society of Refrigerating Engineers.
The Society for Promotion of Engineering Education.
The American Ceramic Society.

N. MEDICAL SCIENCES

**The American Medical Association.
*The American Association of Anatomists.
The American Physiological Society.
*The Society of American Bacteriologists.
The American Society for Pharmacology and Experimental Therapeutics.
The American Society of Biological Chemists, Inc.
The American Society for Experimental Pathology.
The American Public Health Association.
The Society of American Microanalysts.

O. AGRICULTURE

*The American Society of Agronomy.
*The Society of American Foresters.
*The American Society for Horticultural Science.
The American Pomological Society.
The American Association of Official Seed Analysts.
The Potato Association of America.
The American Society of Animal Production.
*Canadian Society of Technical Agriculturists.
The American Dairy Science Association.

Q. EDUCATION

**The National Society of College Teachers of Education.
**The National Society for the Study of Education.
**The American Federation of Teachers of the Mathematical and Natural Sciences.
The American Philosophical Association.
The Phi Delta Kappa Fraternity.

SOCIETIES NOT SPECIALLY RELATED TO ANY PARTICULAR SECTION

**The Society of Sigma Xi.
**The American Association of University Professors.
**The Gamma Alpha Graduate Scientific Fraternity.
The Bibliographical Society of America.
The Gamma Sigma Delta Society.
The Phi Kappa Phi Fraternity.

AFFILIATED ACADEMIES OF SCIENCE

(These are not classed as affiliated societies, but have a special arrangement. Each has a single representative in the Council. For the names of these representatives see the list of Council members, pages 81 to 82. Each affiliated academy receives a financial allowance from the Association each year, to aid in its work.)

The Illinois State Academy of Science.
The Iowa Academy of Science.
The Kansas Academy of Science.
The Kentucky Academy of Science.
The Maryland Academy of Sciences.
The Michigan Academy of Science.
The Nebraska Academy of Science.
The New Orleans Academy of Sciences.
The North Carolina Academy of Science.
The Ohio Academy of Science.
The Oklahoma Academy of Science.
The Wisconsin Academy of Sciences, Arts and Letters.

MEMBERSHIP IN THE AMERICAN ASSOCIATION

Any person interested in the progress of science and education in any way may become a member of the association and all are invited to do so. An application and information card is filled in and returned to the permanent secretary, with a remittance covering the amount of the entrance fee ($5) and the amount of the annual dues for the first year ($5).[1] On receipt of this payment by the permanent secretary the journal is ordered. A certificate of membership is sent to each new member as soon as he has been enrolled.

Any member of an *affiliated society* may become a member of the association, with all the privileges of membership, on payment of annual dues for the first year ($5), the entrance fee being omitted in such cases, *providing application is made before January 1, 1925.* Such application should be made on a special (blue) application card provided for this purpose. This privilege is also open to all who join the association this year for membership in the philological division of Section L (Historical and Philological Sciences).

In making application for membership the blanks on the application card should be carefully filled in, to the end that the permanent secretary's files and the published membership lists prepared therefrom may be correct. Cards may be obtained from the permanent secretary's office at any time.

Life members each pay $100 in one year (having paid the entrance fee or having had it omitted through membership in an affiliated society) and are exempt from all further dues.

Sustaining members each pay $1,000 and are exempt from all further dues.

Members who are engaged in scientific work or who have advanced science by research may be elected to fellowship in the association.

[1] Persons residing in the region of the Pacific Division or of the Southwestern Division send their applications and remittances for the first year to the division secretary instead of the permanent secretary. For later years they pay their dues to the permanent secretary. New members of the State College Branch pay entrance fees and annual dues for the first year to the branch secretary. For later years their dues are paid to the permanent secretary's office. Members of affiliated societies and academies send applications and all remittances to the permanent secretary.

FUTURE MEETINGS OF THE AMERICAN ASSOCIATION

Under the present rules the Association holds its main meeting each year during convocation week—at the time of the Christmas vacation in schools and colleges. It frequently holds a smaller summer meeting also. Because of the early date set for the Toronto meeting of the British Association for the Advancement of Science it has been decided to hold no summer meeting of the American organization this year. The British Association has invited all members of the American Association to participate in the approaching Toronto meeting, which is announced for the period from August 6th to 13th.

The dates for the annual meetings of the American Association are determined according to a rule adopted by the council a year ago. When New Year's day falls on Thursday, Friday or Saturday the meeting period is to be the week (Monday to Saturday, inclusive) in which New Year's day occurs. When New Year's day falls on Sunday the period is to be the preceding week. And when New Year's day falls on Monday, Tuesday or Wednesday the period is to begin on December 27th and continue till January 2nd. It is thus possible to forecast the days and dates of any annual meeting, and plans of individuals and societies may be made accordingly. It requires twenty-eight years to complete the cycle of dates and days. The days and dates and some of the meeting places for future annual meetings are shown below:

1925 (Washington)—Monday, December 29, 1924, to Saturday, January 3, 1925.
1926 (Kansas City)—Monday, December 28, 1925, to Saturday, January 2, 1926.
1927 (Philadelphia)—Monday, December 27, 1926, to Saturday, January 1, 1927.
1928 (undecided)—Monday, December 26, to Saturday, December 31, 1927.

1929 (New York)—Thursday, December 27, 1928, to Wednesday, January 2, 1929.
1930 (undecided)—Friday, December 27, 1929, to Thursday, January 2, 1930.
1931 (undecided)—Monday, December 29, 1930, to Saturday, January 3, 1931.
1932 (undecided)—Monday, December 28, 1931, to Saturday, January 2, 1932.
1933 (Chicago)—Monday, December 26, to Saturday, December 31, 1932.

It is hoped that many societies not generally meeting with the Association will meet with it at the larger, four-yearly meetings, at Washington, New York and Chicago.

SPECIAL NOTICES TO MEMBERS AND PROSPECTIVE MEMBERS OF THE A. A. A. S.

1. The present issue of SCIENCE is sent to all persons whose names are on the roll of the association, whether they regularly receive this journal or the *Scientific Monthly*. For those who have not yet paid their annual dues for 1924, this is the last issue to be sent until after the payment shall have been made. Annual dues were due last October 1. The journal has been continued through January to those few who are still in arrears, with the hope that they would find it convenient to pay before the end of the month. It was also thought that those who are still in arrears would appreciate receiving this special issue with its account of the recent Cincinnati meeting.

2. Owing to the early date (August 6) set for the opening of the Toronto meeting of the British Association for the Advancement of Science, it has been decided to hold no meeting of the American Association next summer. Members of the American Association have been cordially invited to participate in the meeting of the British Association. Further announcements about the meeting will appear in SCIENCE from time to time. The American Association has expressed its desire to help in every feasible way to make the Toronto meeting of its sister association a success.

3. The next meeting of the American Association will be the Washington meeting, from Monday, December 29, 1924, to Saturday, January 3, 1925. This will be one of the larger four-yearly meetings and it will doubtless be very well attended and exceptionally representative of American science. Preparations for the Washington meeting are already under way and announcements about it will appear in SCIENCE from time to time. The preliminary announcement is to be mailed to all members about December 1.

4. *Prospective new members* who are members of any affiliated society are allowed to join the association during 1924 without payment of the usual entrance fee, without reference to when they may have become members of the affiliated society. This is a special offer, in celebration of the seventy-fifth anniversary. It is hoped that large numbers of new members may be enrolled this year.

5. All members of the association are requested and urged to make special efforts this year to secure new members, thus benefiting the new members and at the same time increasing the strength of the association and making it possible for its work to be correspondingly widened.

BURTON E. LIVINGSTON,
Permanent Secretary

SCIENTIFIC NOTES AND NEWS

AT a meeting of the Board of Trustees of the Marine Biological Laboratory, Wood's Hole, held recently in New York City, it was announced that gifts amounting to $1,400,000 had been received for building and endowment purposes for the laboratory. Of this sum $500,000 was given by the Rockefeller Foundation, $100,000 by the Carnegie Corporation, $400,000 by Mr. John D. Rockefeller, Jr., and $400,000, representing the capitalization of a five per cent. basis of a hitherto annual contribution of $20,000 by the Friendship Fund, Inc., which was founded by Mr. Charles R. Crane. Plans prepared by Mr. Charles A. Coolidge, architect, have been studied in detail during the last two years and the building committee has been authorized to begin operations as soon as practicable.

PROFESSOR NIELS BOHR, of Copenhagen, has received $40,000 from the Rockefeller International Education Board, which he may use to modernize his laboratory and to buy new instruments.

PROFESSOR FLOYD K. RICHTMYER, of the department of physics of Cornell University, was elected to succeed Professor Henry B. Ward, of the University of Illinois, as national president of Sigma Xi at its recent annual meeting in Cincinnati.

DR. T. WAYLAND VAUGHAN, of the U. S. Geological Survey, left Washington on January 20, to take up his work as director of the Scripps Institute of Biological Research at La Jolla.

HERBERT E. GREGORY, professor of geology in Yale University, returns to Honolulu on February 1 to resume his duties as directer of Bernice P. Bishop Museum.

PROFESSORS BOHR (Copenhagen), Einstein (Berlin) and von Kries (Freiburg) have been elected foreign members of the Göttingen Academy of Sciences.

BRITISH New Year honors include, as we learn from *Nature*, the advancement of Sir Donald Macalister, president of the General Medical Council, to be a