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THE SYRACUSE MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE AND ASSOCIATED SOCIETIES

Edited by Dr. CHARLES F. ROOS

PERMANENT SECRETARY

GENERAL FEATURES

THE ninetieth meeting of the American Association was held at Syracuse from Monday, June 20, to Saturday, June 25, 1932. The preliminary announcement of this meeting, which was the first meeting of the association at Syracuse, appeared in SCIENCE for May 27, and the general program was published at Syracuse on Monday, June 20. Copies of the program may be secured free from the Washington office of the association.

The president for this meeting was Dr. John Jacob Abel, eminent pharmacologist and medical research worker. Dr. Abel presided at the opening general session on Monday evening.

Four hundred and twenty-six persons registered at the association's registration offices in the entrance of Lyman Hall of the Syracuse University. A check of registration by societies and sections indicates, however, that over one thousand were in attendance. These were distributed about as follows:

Mathematics	39	Economics, Sociology and Statistics	50
Physics	20	Historical Sciences	30
Astronomy	30	Engineering	40
Chemistry	122	Medical Sciences	170
Zoology	137	Agriculture	100
Botany	82	Education	50
Anthropology	50		
Psychology	140		

The general program shows that 289 authors presented 260 papers. Many contributions were made by joint authors. The papers were distributed among the sciences about as follows:

Mathematics	6	Economic and Social Sciences	15
Chemistry	36	Historical and Philological Sciences	6
Astronomy	12	Engineering	8
Geology and Geography	16	Medical Sciences	68
Zoology	7	Agriculture	21
Botany (Several field trips)	3	Education	19
Anthropology	6	Science in general	9
Psychology	28		

There were numerous picnics, society dinners and luncheons.

THE SYRACUSE COMMITTEES

The general local committee, together with its various sub-committees, merits and receives the lasting gratitude of all who attended the A. A. A. S. meetings and especially of the officers. Chancellor Charles Flint, of Syracuse University, Dr. Hugh P. Baker, as general chairman of the local committees, and Dr. Albert L. Elder, as secretary of the general local committee, together with all who cooperated with them, are to be congratulated for the unselfish spirit which they have shown as they sacrificed their time, thought and energy in the hope that the progress of science might be helped thereby. The personnel of the local committee was published in SCIENCE for May 27.

THE PRESS SERVICE

(By Austin H. Clark, Director)

Entirely unexpected was the relatively large amount of press notice resulting from the association's second summer meeting at Syracuse. At the time of year when schools and colleges are closing for the summer and people are beginning to think largely of the out-of-doors and of vacations, it is futile to expect any such extensive publicity as is possible at those seasons when most people are more or less grimly serious—interested in learning something rather than simply in being amused or thrilled. And this year the situation was complicated by the great political conventions, one occurring just before and one just after the meeting. As a result of these conventions it was anticipated that politics would occupy the space that under other circumstances would be available for scientific news.

But these anticipations proved to be unfounded. Most excellent and adequate accounts of the daily proceedings at Syracuse appeared in the press throughout the country, often finding a place on the first page of papers in cities far distant from Syracuse. The main reason for this was the increasingly close cooperation between the members and the Press Service. In advance of the Syracuse meeting this cooperation left nothing to be desired. The proportion of the papers read that reached the Press Service in advance was greater than ever before, and without exception the manuscripts and abstracts were in most excellent shape.

Although the number of papers presented was, when compared with those delivered at the winter meetings, relatively small, many of them included unusually good material for popular exposition. As a result of the excellence of the material and of its presentation, and also of the early receipt of the papers, the representatives of the press were able to prepare most interesting as well as accurate accounts of the meeting, reflecting the greatest credit on them and at the same time presenting the work of the members of the association to the general public in the most desirable light.

GENERAL SESSIONS

Beginning with Monday afternoon at 3:00 P. M. and extending through Friday evening there were thirteen general lectures given on a variety of subjects, which included anthropology, psychology, botany, public health, astronomy, history, engineering, mathematics, physics, economics and the exposition of science.

Dr. Richard Thurnwald, of the University of Berlin, discussed some traits of society in the South Sea Islands with special reference to the house types, settlements and social organizations of groups in New Guinea and the Solomon Islands. He pointed out that racial, social and cultural distinctions rarely coincide with linguistic distinctions and warned against dogmatism.

In the Monday evening lecture, on "The Psychology of Capital," Dr. Edward L. Thorndike, of Columbia University, said that saving to create capital goods is in part due to a craving for power and for the approval of the world and one's self. Different individuals value power differently. Some seek it through physical force, some by intellect and special talents, some by popularity, some by official status, some by ownership or control of material wealth. Material wealth is very clearly power to trade and to manufacture. Consequently, the business man not only craves some special capital on which to exercise his abilities, but also capital in general to turn into general industrial or commercial power, and so do many others than business men. But power through bank deposits or stock certificates is a rather remote and dull thing compared with power through strength or beauty or popularity or skill.

Dr. Rodney H. True, of the University of Pennsylvania, discussed the toxicity of inorganic substances. He defined toxic equivalent to be the strongest concentration of a substance that just permits life to persist in the primary roots of *Lupinus albus* placed in the solutions for a period of 24 hours. His experiments have shown that the commoner inorganic anions have a relatively low toxic activity, the kation being usually the harmful component. An attempt to draw a parallel between the toxic equivalents of the kations and anions making up a long series of inorganic substances and (1) their atomic weights, (2) electrolytic solution tensions and (3) speeds of migration showed no consistent relation between these physical and chemical constants and the physiological characteristic, the toxic equivalent. He advanced the conclusion that tolerance or susceptibility of plants to the substances studied is the result of a geologically-old process of accommodation of plants to their solution-environment. This solution-environment has never consisted of solutions of single substances, like those tested in the laboratory, but has always consisted of mixtures of substances that mutually antagonize each other's toxic properties, approaching a more or less perfect "physiological balance."

On Tuesday afternoon Dr. Dixon R. Fox, of Columbia University, delivered a general address on "Refuse Ideas and Their Disposal" in which he showed how certain beliefs and practices, such as astrology, bleeding and others accepted as established truths by the scientists of one generation, gradually disappeared from intellectual society but continued to exist in the lower strata of civilization. The theological garments once worn in New Haven now cling to the mountaineers of Tennessee and Arkansas.

On Tuesday afternoon Dr. W. G. Smillie, of the Harvard School of Public Health, said that many students of acute respiratory infections have felt that common colds are infectious and are spread by direct contact. Others have believed that environmental factors are important, either as causal or contributory agents. Epidemiological studies under conditions in which various possible etiological factors could be studied under controlled or at least measurable conditions were conducted in an isolated community on the Patsiliga River in Alabama, at North West River, a Hudson Bay fur trading post in the interior of Labrador, as well as at St. John, one of the small Virgin Islands in the West Indies, at Spitzbergen, a Norwegian coal-mining community within the Arctic Circle. Serial bacteriological cultures were made of the naso-pharyngeal flora of the people in health and also during periods of illness with acute respiratory disease. Careful epidemiological data were kept of the incidence of each case of acute respiratory disease in the areas. Various environmental factors, such as daily variations in temperature, relative humidity, wind velocity, sunshine, precipitation and, in Spitzbergen, air ionization were measured. In all the areas which he studied epidemic colds seemed to be caused by a specific infectious agent (probably a filterable virus) which was spread by direct contact, with an incubation period that lasted about thirty-six hours.

Dr. Thomas Parran, Jr., state commissioner of health, gave a brief survey of the development of the public health movement in Onondaga County, and credited Joshua Forman, a pioneer, as being its instigator.

In the early days of public health, organized effort was maintained only to combat disease and, once an epidemic had subsided, the united fight against disease stopped. The duties of the early health officer were nothing more than a fight against visible filth. The death rate from tuberculosis in New York state during the past fifteen years has been reduced 50 per cent. Approximately forty-six thousand people are living to-day because the 1913 death rate has been thus reduced.

On Tuesday evening Dr. J. O. Perrine, of the Bell Telephone Laboratories, lectured on "Television, Its Fundamental Physical and Psychological Principles." He illustrated the operation and functions of the principal elements of the television transmitter and receiver. The photoelectric cell, aptly called the electrical eye, was connected to a neon receiving lamp with a vacuum tube amplifier intervening. It was thus possible to demonstrate that light variations at one point, those of a fluttering match, can immediately produce changes in the intensity of the light emitted by the neon lamp.

An important property of both the photoelectric cell and the neon lamp as elements of a television system is their speed of response. To articulate this property, the light of the neon lamp was modulated by currents from an electrical phonograph reproducer.

Pictures are substitutes for vision. A two-dimensional phenomenon thereby replaces a three-dimensional one. In television, a two-dimensional phenomenon in space is transmitted by a one-dimensional system in space. Wire and radio circuits are single-track systems, that is, one-dimensional systems. Hence, the element of time must be substituted for one dimension in space. This means that pictures can not be sent as a whole, but must be sent on the instalment plan. At the receiving end of the television system the succession of picture elements in

electrical form are retranslated into light variations and reassembled in two dimensions.

This translation of two-space dimensions into one-space and time dimension is accomplished by the principle of scanning with a spot of light. The obtaining of individual picture elements by a rapidly moving spot of light traveling in parallel lines was demonstrated. With the room in darkness, the face of one of the audience was slowly scanned, with no recognition on the part of the audience. However, when rapidly scanned, the face was recognized as if it were all illuminated by a floodlight. The persistence of vision on the part of the human eye as contrasted with the electrical eye is a psychological factor capitalized in television.

Professor Earle R. Hedrick, of the University of California at Los Angeles, made a plea for closer cooperation between mathematicians and educationalists. He urged that state laws be passed requiring teachers of science to have had at least one college course in the science they teach.

Professor Walter B. Carver, of Cornell University, emphasized the need for inspired science text-books and teachers of science. He pointed out some of the contributions of mathematics to science, indicating how branches of mathematics which interested only the mathematicians twenty-five years ago are now prescribed and necessary for physicists and engineers.

On Wednesday evening Dr. W. F. G. Swann, of the Franklin Institute, gave an illustrated lecture on "Cosmic Rays." Over land, the main sources of atmospheric ionization are the radioactive materials in the soil and in the atmosphere. Over the great oceans, where there is a negligible amount of radioactive material, or in vessels over land when shielded from radioactive influence, ions are produced at a constant rate which increases with altitude, indicating a source of ionization external to our atmosphere. This source of ionization is known as the cosmic radiation. The lecture described experiments made in balloons, on mountains, and lakes at high altitudes, with the object of ascertaining the nature of this radiation. The evidence for the various possibilities, electron rays, photons and neutrons was discussed; and the recent experiments by Millikan and his school, concerned with the disintegration products produced by the radiation in Wilson cloud chambers, were described. These experiments show the existence of secondaries of both positive and negative charge, with energies extended up to a thousand million volts. The lecture was illustrated by experiments demonstrating the normal conductivity of the air, the existence of radioactive material in the atmosphere, and the existence of the cosmic radiation as shown by systems of Geiger Counters.

In a general address on "Solar Coronal Problems" Dr. Frederick Slocum, of Wesleyan University, discussed coronal form, structure and motion. He pointed out that the spottedness of the sun and more especially near the limb on the eclipse day was of more significance in determination of form than the mere stage in the solar cycle.

In the Thursday evening address, Dr. Graham Lusk, of New York City, explained the contributions of his friend, Max Rubner, to the science of nutrition. Dr. Lusk's address will be published in full in an early number of SCIENCE.

Dr. Henry Crew, of Chicago, delivered the final evening lecture on "The Exposition of Science." He passed from a discussion of the systematic presentation of science at school and college to the difficulty connected with the putting of science before the public through the press. An outline of commercial expositions of ancient and medieval times was followed by a sketch of more recent international expositions in which each of these was shown to have an individuality and character of its own. The distinguishing feature of the Chicago Exposition of 1933 was found in its principal theme, which is the indebtedness of industry and engineering to pure science and the increased leisure which has come to society. The speaker's remarks were confined to what had already been accomplished at Burnham Park, Chicago, and these results were clarified by the use of some eight or ten slides at the close of the lecture.

SECTION A (MATHEMATICS)

(Report from Floyd A. Decker)

Section A held two sessions on Tuesday for the reading of three papers. In the morning session Professor H. M. Gehman, of the University of Buffalo, developed several theorems on the homeomorphic geometry of the projective plane. He showed how analysis situs can be thought of as a branch of geometry. Professor W. A. Hurwitz, of Cornell University, discussed logical foundations for groups and fields. In the afternoon session Professor J. A. Shohat, of the University of Pennsylvania, considered a number of problems in interpolation. Among these were the problems of convergence and stability (the extent to which errors in the given values of $f(x)$ affect the interpolating function) of approximating polynominals and other functions. On Wednesday morning Section A joined with Section K for a session on mathematical statistics and a report on collegiate mathematics needed by social scientists (see report of Section K). On Wednesday afternoon members of Section A attended a general session on the teaching of mathematics to hear Professor Earle

R. Hedrick and Professor W. B. Carver (see General Sessions).

SECTION C (CHEMISTRY)

(Report from C. C. Spencer, W. C. Coleman, C. M. Schwartz)

The program of Section C consisted of that of the intersectional meeting of the Northern New York sections of the American Chemical Society.

Dr. J. B. Sumner, of Cornell University, concluded from many observations that enzymes, such as urease, are proteins and that antiurease reacts stoichiometrically with urease. Dr. V. K. LaMer, of Columbia University, concluded that calcium is more likely to be the limiting factor in nutrition than phosphorus. He said that bone growth and other calcification takes place when the blood is supersaturated with tertiary calcium phosphate.

A second paper by Dr. LaMer introduced a new field in chemistry, the reaction of acids with bases in solutions other than aqueous. He showed that it is possible to arrange many acids in the order of their increasing strength in benzene. By the use of Z-rays, Dr. Neil Gordon, of the Johns Hopkins University, showed that in dyeing cloths a chemical reaction occurs between a dye and the mordant. P. G. Newsome, of the Eastman Kodak Research Laboratory, correlated the swelling and solvating action of many organic solvents with functions involving their dielectric constants or dipole moments. Dr. A. W. Browne, of Cornell University, exhibited some glassy crystals, compounds of nitrogen and hydrogen, which were so stable that strong detonation was necessary to explode them. Dr. V. J. Chambers and Dr. Linus Webb, of the University of Rochester, described an ingenious device for filling and evacuating a barometer or manometer.

At a luncheon on Friday noon, attended by nearly one hundred, Dr. R. T. Baldwin, of New York, treasurer of the American Chemical Society, gave an interesting talk on "Some Books Which Chemists Do Not Read." He referred to the verbatim reports of important patent suits and of important hearings before tariff and other government commissions.

At the Friday afternoon session, Dr. R. C. Young, of the Massachusetts Institute of Technology, offered an explanation of the mechanism of the oxidation and reduction of tungsten and molybdenum in complex cyanides where these elements pass from a trivalent or pentavalent to a tetravalent state. G. R. Fonda, of the General Electric Company, described a new type of cathode ray tube to be used for the quantitative analysis of metals. Time is saved by having the target outside the ionization chamber, thus facilitating change of the target substance. The cathode ray method has the advantage over the ultimate ray method in spectroscopy in that percentages as high as 95 can be readily determined. Dr. A. J. King, of Syracuse University, reported that x-ray studies of subfluorides of the alkaline earths discredit the theory of the formation of subsalts of barium.

SECTION D (ASTRONOMY)

(Report from Philip Fox)

As expected, the attendance at Syracuse was small, about thirty for each of two sessions; astronomers are preoccupied with preparations for the solar eclipse of August 31. Comments are limited to a few of the sixteen papers presented.

R. C. Williams described an interesting method of deposition of chromium on glass for reflectors. The success of his process and the high reflecting power of the product, especially in the ultra-violet, may be of great value to astronomy. F. G. Pease described the new support for the 100-inch mirror. By the use of ball-thrust bearings the friction between the supporting disks and glass and the distortions from this cause have been largely eliminated.

Dr. S. B. Nicholson and Miss E. E. Sternberg estimate the date of sun-spot minimum between 1933.6 and 1934.8. The date of minimum is important in view of the approaching solar eclipse and the coronal form to be expected. Professor Frederick Slocum, however, in his address on "Solar Coronal Problems," pointed out that the spottedness of the sun on the eclipse day and more especially near the limb is of more significance in determining the form of the corona than the mere stage in the solar cycle.

Calculations of Dr. Ross Gunn indicate that the magnetic and electric forces in the sun's atmosphere far exceed those of gravity and radiation pressure and should determine the stability and provide the mechanism for the support of the corona. He urged that observations of the rotation of the upper chromosphere and corona be included in eclipse programs. R. S. Richardson finds evidence for all three of the strongest bands of the hydrocarbon molecule at λ4300, λ3900, λ3143, in the solar spectrum. He finds also a temperature gradient of 13° per km and relative pressure in sun-spots and reversing layer of 0.48. R. W. Shaw identifies members of the OH bands at λ3064 and λ3428 in the solar spectrum and from a study of the intensities of the lines derives a solar temperature of 5100° C. W. S. Adams and Theodore Dunham found three new bands in the infra-red spectrum of Venus at λ7820.2, λ7882.9 and λ8688.7, all degraded toward the red. Evidence indicates that they may be due to carbon dioxide.

The report of Professor S. L. Boothroyd on the

Arizona Meteor Expedition indicates an astonishing number of meteors observable in the clear atmosphere of Flagstaff. Ascent of the San Francisco Peaks to 10,500 feet resulted in large additional gains. Velocities of 200 to 300 km/sec for the telescopic meteors are frequent.

By a systematic search Dr. R. E. Wilson has more than doubled the membership of the Taurus cluster. He adds 221 "group stars" with spread of the group to diameter 250 parsecs. Dr. R. F. Sanford presented accumulated evidence for the presence of the carbon isotope C_{13} in stars of classes R and N. The bands and their growth in sequence of three class R and four class N stars were shown by slides. A paper by Dr. Paul W. Merrill gave evidence that the line λ5577 of novae is identical with the green line of the aurora and that the pressure in the emitting shells of novae is between that of the nebulae and the tenuous auroral strata of the earth's atmosphere.

SECTION E (GEOLOGY AND GEOGRAPHY)

(Report from Kirtley F. Mather)

Section E joined with Section O and with the American Society of Agronomy for the symposium on "Land Use" which was held on Tuesday morning, June 21 (see report of Section O), and on Tuesday afternoon it participated in the symposium on "Aerial Photographic Surveying and Mapping," organized jointly with Section M (see report of Section M). On Wednesday morning there were nearly 100 in attendance upon the session devoted to papers on physiography and glacial geology. About 65 participated in the field excursion that afternoon to the Clarke Reservation Plunge Basin, Tulley Moraine, Labrador Hollow and Skaneateles Lake. Dinner at the Kan-Ya-To Inn was enlivened by reminiscences offered by Professor W. H. Hobbs and Dr. Rudolf Ruedemann.

At the Thursday morning session there were several interesting papers on stratigraphic problems of the Syracuse region. The afternoon field trip was likewise devoted to the study of local stratigraphy. On Friday, June 24, about 35 members of Section E participated in an all-day field excursion to Frankfort Gorge, Little Falls, Dolgeville, Trenton Falls and Utica. All in attendance were especially grateful to Professor George B. Cressey, local representative for Section E, and to Professors E. T. Apfel and L. W. Ploger, leaders of the field excursions, for the excellent service which they rendered.

SECTION F (ZOOLOGICAL SCIENCES)

(Report from George T. Hargitt)

The sessions of Section F began on Tuesday morning with a round table discussion on "Methods of Rearing and Maintaining Cultures on Invertebrate Animals," led by Dr. J. G. Needham, of Cornell University. The interesting presentation of experimental data and the abundant discussion made this a most valuable contribution to the meetings. The emphasis for this summer meeting was placed upon field excursions and informal discussions, Section F joining with the Botanical Society of America, the Ecological Society of America and other botanical groups. On Tuesday evening Dr. W. L. Bray, of Syracuse University, in outlining the features of the places to be visited on the excursions, gave an interesting address on the "Physiography, Ecology, Fauna and Flora of the Syracuse Region." For further details see the report of Section G. Drs. J. G. Needham and A. H. Wright, of Cornell University, Dr. C. C. Adams, of the New York State Museum, and Dr. Charles E. Johnson, of the New York State College of Forestry at Syracuse University, were the zoological leaders; prominent botanists and ecologists led discussions in their fields. These field excursions and discussions were very successful and valuable and were enjoyed by the large number who attended; the union of botanical, ecological and zoological interests in the same field trips proved to be unusually attractive. The success of these trips was largely due to the care exercised in the choice of regions and leaders and the attention given to all necessary details. An informal reception on Tuesday evening and a dinner on Wednesday evening brought all biologists together in pleasant social gatherings. The individuals and committees of arrangement for the biological meetings have the thanks of the visiting biologists.

SECTION G (BOTANICAL SCIENCES)

(Report from A. J. Eames and H. F. A. Meier)

The Botanical Society of America, following the custom established in 1929 of holding summer meetings, met on June 21, 22 and 23, joining this year for the first time with the American Association. (The Pacific Section of the society joined in the Pasadena meeting of 1931.) In its earlier independent meetings the society has found meetings less formal in nature than the winter meetings, with emphasis on field trips, to be most satisfactory, and the Syracuse meeting, planned on this basis, was also most successful. Union with other biologists—members of Section F, the Ecological Society of America, the American Fern Society, the Torrey Botanical Club and Syracuse botanists—in field trips and general meetings added greatly to the success of the meeting.

On Tuesday the forenoon was given to demonstrations and exhibitions in cytology, morphology and physiology. Dr. P. J. Sedgwick, of Syracuse Univer-

sity, showed excellent motion pictures of plant growth and development and of the preparation of material for laboratory teaching. In the afternoon about 85 members took the field trip to Green Lake and White Lake in the Jamesville region. Here limestone ridges and talus slopes, with colonies of the rare *Scolopendrium,* and the boggy shores of marl lakes were visited. Attention was given to the unusually interesting glacial geography of the region.

In the evening Dean W. L. Bray, of Syracuse University, addressed a joint meeting on "Some Aspects of the Physiography, Ecology, Flora and Fauna of Central New York." Following the lecture an informal reception for biologists was held in the rotunda of the Forestry Building.

All day Wednesday was given to an excursion to the Junius region. With perfect weather about 85 members enjoyed the opportunity of studying the flora and fauna of one of the most interesting regions botanically and ecologically in Central New York. About a group of small ponds are marl bogs and moors, peat bogs, and sandy fields and woodlands, presenting an unusual combination of habitat and soil conditions, and many rare plants and animals. The effect of soil on local plant distribution is striking in this small area.

In the evening an informal dinner for all biologists was held in the Home Economics Cafeteria, with Dean W. L. Bray presiding.

On Thursday morning a round-table discussion of cell wall structure, led by Dr. W. M. Harlow and an exhibition of rare and unusual plants collected on the field trips held the attention of members. In the afternoon about 25 persons visited the salt flats about Onondaga Lake on the outskirts of the city of Syracuse, noting the plants of coastal salt marshes to be found there. The party then continued to the sandy ridges and peat bogs of Phoenix.

With a registration of 82 botanists and an attendance of about 100, and with the opportunities provided by the informal nature of the gathering for the making and renewing of acquaintanceships, the meeting was most successful.

SECTION H (ANTHROPOLOGY)

(Report from Carl E. Guthe and D. G. Haring)

Section H held two sessions on Monday, June 20, both of which were devoted to the consideration of certain aspects of cultural problems centering about Oceania. D. S. Davidson, of the University of Pennsylvania, opened the meeting with a presentation of some problems of Australian culture. He said that the distribution of several forms of stone implements is correlated with factors of climate, utility and past and present agencies of diffusion. Some of these traits may be indigenous, others may have originated outside of Australia.

Mrs. Willowdean C. Handy, of the B. P. Bishop Museum of Honolulu, showed that the elaborate and highly conventionalized art of the Marquesan people to-day is the result of the mixture of two schools, one of which was that of the wood carvers, who emphasized the human form, and the other that of the tattooers, who tended more towards animal and plant designs.

Miss Helen H. Roberts, of the Institute of Human Relations at Yale University, opened the afternoon session by presenting a chart upon which had been plotted the distribution of peculiar and unnatural cultural traits throughout the world, with special reference to southeastern Asia, to Oceania, and to the New World. These traits included such customs as the use of conch shell trumpets, distending the ear lobe, making bark cloth, mastication of plant roots for ceremonial drinks, cutting the hair in patterns, certain types of mutilation, etc. The most striking result of such a tabulation was the demonstration of the grouping of some of these traits in certain culture areas and their concentration in widely separated regions.

Dr. Richard Thurnwald, of the University of Berlin, discussed some traits of society in the South Sea Islands (see General Sessions). The importance of ethnobotanical research in the study of cultures was then emphasized by E. S. C. Handy, of the B. P. Bishop Museum of Honolulu. He demonstrated his thesis by drawing upon his knowledge of the South Sea Island cultures, and the uses made in them of such plants as sugar cane, coconuts, breadfruit, taro, gourds and sweet potatoes. Ethnobotany is closely related to a number of cultural complexes, and therefore has an important part to play in the study of culture.

The sessions of section H were closed by Percy C. Madeira, of the Museum of the University of Pennsylvania, who said that chronological study of the known historical dates associated with the great ancient civilizations of southeastern Asia and the East Indies demonstrates that none of these ruins were built prior to the seventh century A. D., which likewise marks the close of the first epoch of the famous Maya civilization of Middle America. It is clear, therefore, on purely chronological grounds, without considering other equally important factors, that the complex civilizations of the East Indies could not have influenced the similar complex civilizations of the New World.

SECTION I (PSYCHOLOGY)

(Reports from Harry W. Hepner, Gordon L. Barclay and Wesley R. Wells)

The "Industrial Psychology" symposium was opened by the chairman, Dr. Paul A. Achilles, Psychological Corporation, with a paper, "Salvaging Old Age in Industry." He said that recent investigations of psychologists indicate that learning capacity continues much longer than has been supposed. Studies made by E. L. Thorndike, Walter R. Miles, Edward K. Strong, and Lillien J. Martin, indicate that age only is not a sound measure of fitness for a given job. Individual differences are far more important than age differences, and the employers should consider the applicant's personal fitness for the job rather than his age alone. Dr. R. M. Little, chief of the Rehabilitation Bureau of the New York State Department of Education, said that some of the physically handicapped develop mental abnormalities that tend to handicap them still further, whereas others have unusual resilience and flexibility in making adjustments to new occupational limitations. Dr. M. R. Trabue, of the University of Minnesota, described the diagnostic work of the Minnesota employment study and operational patterns developed for successful and unsuccessful workers in important occupations. In general, the symposium indicated some of the ways in which psychologists are attempting to meet the needs of the aged, physically handicapped and the unemployed.

Dr. John Levy, of New York City, opened the symposium on "Mental Hygiene," on Friday morning with an address in which the present status of mental hygiene was reviewed and the purpose of the symposium was stated. Dr. Paul Popenoe, director of the Institute of Family Relations in Los Angeles, in presenting the contribution of heredity to the field of mental hygiene reviewed the evidence of hereditary factors in mental deficiency and psychoses. Dr. Ruth Benedict, of Columbia University, declared that normality in behavior is a man-made, culturally defined concept and that anthropology may point out ways in which our own culture may be improved and means by which the "misfits" or "abnormals" in our culture may be better utilized. Dr. Mary E. Johnson, of the department of sociology, Syracuse University, in presenting the point of view of the scientific sociologist said that the sociologist seeks norms of behavior and the deviates from them. Sociology may contribute normal data to mental hygiene to offset of the current preponderance of abnormal data. Mental hygiene workers need sociological training in order to interpret properly social data. Dr. Shailer Lawton, of New York University, said that analysis of various levels of organismic behavior shows that only a very small proportion is cortically controlled. Differences in glandular balance provide the basis for various personality types. Mental hygienists may avoid much futile effort by a proper understanding of these factors. Dr. Bertram Lewin declared that psychoanalytic therapy is of invaluable assistance in the clinical treatment of many types of cases. He said that psychoanalytic theory has provided a psychology of instinctual activity, empirically grounded, which no other science can supply. Dr. George Mohr, of the Child Guidance Clinic of Pittsburgh, indicated that the task of psychiatry is an integrative one, interpreting behavior from a psychobiological standpoint. Dr. Gilbert J. Rich, of the Institute for Juvenile Research, Chicago, outlined the contributions of psychology to the development of mental hygiene. He said that studies of individual differences in the latter half of the past century gave way to the beginnings of clinical psychology and the mental testing movements. The major contribution of psychology has been the introduction of objective methods in dealing with the problems of mental hygiene. The techniques of correlational studies and standardization methods may be cited as examples.

A luncheon for the speakers provided opportunity for informal discussion. Gordon L. Barclay, clinical psychologist of Syracuse University, opened the afternoon session with a résumé of the morning's contributions. Approximately 140 persons attended the symposium.

The ninth meeting of the Upper New York Psychologists was held on Wednesday and Thursday, June 22 and 23. The Wednesday afternoon session was devoted to papers in the fields of educational and of social psychology. The group was honored by the attendance of Dr. J. McKeen Cattell at the dinner on Wednesday evening. The Thursday morning session consisted of a round-table discussion of experimental work in progress in the laboratories represented. There was extended discussion of reports on experiments bearing on Gestalt theories. The final session, on Thursday afternoon, was devoted to papers on learning in horses, paradoxical warmth, the perception of visual motion and the development of tolerance for a caffeinated beverage, and other topics.

SECTION K (SOCIAL AND ECONOMIC SCIENCES)

(Reports from H. Hotelling, H. S. Kantor, S. S. Wilks and F. G. Crawford)

All meetings of Section K were held jointly with the affiliated Econometric Society. Mr. R. H. Whitman, of the University of Chicago, opened the Tuesday morning session, devoted to a symposium on

"Demand," with an account of his work on the fitting of demand functions of more general types than those used by H. L. Moore to price data for iron and steel. Terms involving the rate of change of price and the time-integral of price were included in various combinations. High multiple correlations were obtained for each of the periods 1902–1915, 1916–1920 and 1921–1930. Dr. C. F. Roos showed how the effect of past prices and the memory of past purchases lead to a demand function containing an integral either of past prices or past purchases, the two forms being equivalent on account of the invertibility of the linear integral equation. He declared that in the newer view of demand the concept of utility will be demoted from a major to a very minor place. In the final paper of the session an experimental study of indifference curves was described by Dr. L. L. Thurstone, of the University of Chicago.

On Wednesday morning Dr. Ragnar Frisch, of the University of Oslo, considered the problem of finding several types of linear regressions which are invariant under a general, linear transformation. Dr. S. S. Wilks, of Columbia University, showed how the work of Professor Frisch can be connected with the theory of small samples. He described his recent work, which has yielded the sampling distributions of determinants of covariances and of certain ratios of these determinants. This distribution, which has a very wide range of applications, generalizes R. A. Fisher's analysis of variance distribution. By setting up an analogy with physical systems Professor H. T. Davis, of the University of Indiana, showed how the problem of perturbation in economic series has all the essentials of the problem of explaining the methane spectrum by means of the perturbations of the atoms. Dr. A. J. Lotka, of the Metropolitan Life Insurance Company, gave a mathematical approach to the problem of industrial replacement which has been previously considered by E. B. Kurtz on an empirical basis.

A report on mathematics needed in the social sciences, adopted by the Social Science Research Council after the deliberations of a committee on the subject, was read by Dr. Mordecai Ezekiel. Sections A and K approved the recommendations that undergraduates should, in preparation for work in the social sciences, study logarithms, graphic methods, interpolation, equations and forms of simple curves, probability, and the elements of differential and integral calculus and curve fitting.

The Thursday afternoon symposium on agricultural supply and demand functions was opened by Professor F. A. Pearson, of Cornell University, who gave the results of a study of the relations between the supplies of corn, potatoes, wheat and beef in various localities of the United States and prices (in some cases retail and in others wholesale prices) in New York City. In the next paper Dr. Mordecai Ezekiel examined various functional set-ups for the demand curves of two competing products. In particular, he discussed the cases where the price of each product is expressed as an additive function of the supply of both, and where the price of each is expressed in terms of its own supply and the price of the other. In the last paper of this symposium Dr. Louis H. Bean, of the Department of Agriculture, discussed the derivation of instantaneous demand-supply curves, characteristics of shifts in demand curves and a type of demand-supply curve which represents the response of producers to price in future planning.

Professor T. N. Carver began the Thursday morning symposium on money and credit with a paper which outlined the manner in which the expansion and contraction of credit affect business and prices. Dr. Carl Snyder, of the Federal Reserve Board, in speaking on the concept of momentum and inertia in economics, illustrated the long-period movements of economic variables with elaborate colored charts. Professor M. D. Anderson, of the University of Florida, presented a paper on a theory of interest from the equation of exchange. Alvin H. Hansen, Professor Joseph Mayer, Dr. H. Hotelling, Frederick V. Waugh, H. S. Kantor, S. S. Wilks, Professor J. A. Shohat, Dr. E. R. Hedrick and many of those who gave papers contributed to the discussions.

Following this session members of the society motored to Ithaca, where as the guests of Cornell University they were shown about the campus, including particularly the statistical laboratories presided over by Professor G. F. Warren and Professor F. A. Pearson. The meeting ended with a delightful picnic in Cascadilla Gorge.

SECTION L (HISTORICAL AND PHILOLOGICAL SCIENCES)

(Report from Ralph V. Harlow)

The sessions of Section L, on Tuesday, June 21, were arranged and conducted by the officers of the New York State Historical Association. The morning session, with Dr. Dixon Ryan Fox, of Columbia University, presiding, was devoted to certain aspects of the social history of New York State in the early nineteenth century. Papers presented by Mr. J. R. Curtiss, Mr. C. DeWitt and Miss B. M. Stearns furnished the stimulus for lively discussion of certain highly significant aspects of the social history of those days.

In the first afternoon session, Dr. A. C. Flick, state historian of New York, read a paper on "Some Aspects of New York History." After a brief reference to the great value and importance of local history, he pointed out the nature and the significance of the Indian, the Dutch and the French contributions to the early development of New York. He emphasized the fact that historians generally have been inclined to underestimate both the Indian and the French influence.

Dr. Frederick S. Parkhurst, of Kenmore, New York, delivered a paper on "The Biography of a Town," a survey of the history of Lyndon, New York, with an analysis of the causes of its rise and decline. Although Dr. Parkhurst confined his attention to a single town, the principles which he brought out were typical of the rural history of both New York and New England.

The final session was devoted to a general address by Dr. Dixon R. Fox, Columbia University, on "Refuse Ideas and Their Disposal" (see General Sessions).

SECTION M (ENGINEERING)

(Report from N. H. Heck)

The meeting of Section M consisted of two sessions, the first with papers related chiefly to industrial engineering and the second a symposium held jointly with Section E on "Aerial Photographic Surveying and Mapping." In the first Dr. Myron A. Lee showed that the problem of production control and material control is the same in all plants, even though the methods differ. He described the scheme used in a medium-sized plant in detail. In mass production the methods are somewhat simplified. While the principles are well understood they have been applied only to individual industries and not to industry as a whole, and this lack of planning may in part at least be a cause of the present conditions in industry.

Dr. Donald A. Laird presented the results of a study with collaborators of the effect of noise on output with special reference to the rôle of diet in relation thereto. A high carbohydrate diet lessens the worker's feeling of fatigue and not only increases production under quiet conditions, but under conditions of moderate noise is equivalent to low carbohydrate diet under quiet conditions.

Mr. Kenneth C. Reynolds showed that the proper design of many river and harbor improvements, of dams and of hydraulic features of hydroelectric and irrigation projects has been taken from the realm of trial and error and made a scientific up-to-date procedure. This is accomplished through the use of a miniature of the proposed hydraulic structure over which a properly regulated flow of water duplicates nature.

In the symposium on aerial photographic mapping, Mr. Charles Davey gave a history of the development of this art in the United States. Though the fundamental principles of perspective were first noted in 1759 and apparatus was developed in 1849, it was not till 1900 that stereo-photography laid the basis for a photographic method universally applicable to mapping. Multiple chamber cameras have been developed through the cooperation of several government bureaus and recently a five-chamber camera has proved especially effective. Professor Earl Church stated that at Syracuse University special attention has been given to mathematical analysis based on measurement of aerial photographs. Mr. L. H. Caldwell described the use of the aerocartograph, a German apparatus, which is specially useful in connection with the extension of aerial triangulation. Mr. H. L. Cooke, under the title "Photosculpture," after pointing out certain weaknesses of aerial methods under unfavorable conditions explained how with two projection cameras correctly oriented it is possible to form a model of the terrain which can be carved on a block of suitable material. With proper orientation the composite images will be sharply defined only when the material to be carved is at the right height. Mr. Irving H. Crosby pointed out the great value of aerial photography in geological studies, especially in a poorly mapped region.

SECTION N (MEDICAL SCIENCES)

(Report from M. S. Dooley, C. M. Schwartz, G. S. Hucher, E. F. Adolph and Earl E. Moch)

The program of Section N was such as to interest not only those working in the basic sciences, but to a marked degree clinicians of this locality. Community interest was elicited because of the number and kind of organizations participating in the program, which was sponsored by the College of Medicine of Syracuse University. This series of meetings led off with a notable public health program, in which Dr. Thomas Parran, Jr., commissioner of health of the State of New York, and Dr. Wilson G. Smillie of Harvard University School of Public Health, were the speakers (see General Sessions).

One hundred attended the sessions of the forty-fourth meeting of the Western New York Branch of the Society for Experimental Biology and Medicine. An interesting paper on "Synthetic Diets for Herbivora" was given by Dr. J. C. Woodward and Dr. C. M. McCay. They found that both goats and rabbits eat foods containing regenerated cellulose. Weaned kids, when put on a synthetic diet, continued to grow

normally and remained in balance for about one year, the cellulose content of the diet being increased as growth occurred. Young rabbits, when fed a synthetic diet, continued to grow for about one month and then developed paralysis of the hind legs. Muscles of these rabbits were found to be smaller than normal. If alfalfa leaves are fed, this paralysis does not occur. Mature rabbits can be maintained on the synthetic diet for about three months, and then develop a paralysis similar to that of young rabbits.

Dr. E. F. Adolph, M. J. Gerbasi and M. J. Lepore reported that increase of pressure within the abdomen, applied by means of a trocar through the anterior abdominal wall, results in a change of water distribution. W. S. Root said that time is a factor in considering the dissociation curve of carbon-dioxide of muscle and nerve. Dr. W. R. Bloor, E. Buckner and B. F. Gibbs reported that arteriosclerosis causes the death of 47 per cent. of all diabetics. High concentration of cholesterolesters in the blood plasma may be the cause of arteriosclerosis. Professor W. J. Atwell reported that administration of pituitary gland will restore function only when ovary is present and that cortin given twice daily—equally spaced from three to seven weeks—does not produce effect on growth. Professor C. O. Lathrop and C. Burwell said that soaps that are 20 per cent. of original concentration were found to have antiseptic effect on pustular infections. All bacteria were killed in ten minutes. A. G. Eaton and Professor J. R. Murlin reported that cerebroside fraction causes high blood sugar and a low respiratory quotient.

G. H. Maughan said that irradiation of hens increases the Vitamin D content of the eggs produced. The ability of the hen to store Vitamin D is, however, limited. Professor A. Knudson said that sunshine, when combined with low humidity and no smoke, is most effective, especially between the hours of 11 A. M. and 2 P. M. Professor H. C. Sherman, Columbia University, said that Vitamin G is a multiple nutritional factor, of two or more substances, all of which are necessary for growth. There appears to be a wide zone between the minimum and maximum amounts required, but an intake greater than the minimum amount results in the improvement of the health in general. Dr. Shiro Tashiro, University of Cincinnati, reported that increased susceptibility to the action of bile salts is due to decrease of bile salts antagonizers used as phospho-lipids. This results mainly in hemolysis, delay in coagulation time of the blood and also increase in percentage of gastric ulcers.

Professor Frank A. Hartman, University of Buffalo, reported that lack of cortin mainly affects the control nervous system, resulting in twitching, insomnia, etc., and eventually coma. Administration of cortin causes the symptoms to disappear in the reverse order of their appearance. In normals, cortin administration delays fatigue and also makes possible a more restful sleep. Cortin lessens reflex action and thus reduces heat production, and it also causes a decrease in resistance to toxins. Professor Frank A. Hartman, University of Buffalo, Dr. H. S. Liddell and Dr. O. D. Anderson, Cornell University Medical College, said that administration of cortin to neurotic sheep produces an increase in the magnitude of conditioned reflexes, while at the same time tending to remove the neurosis.

At a joint session of the Onondaga Medical Society and the Syracuse Academy of Medicine, four papers were presented to an audience of 172. Dr. Robert Elman, Washington University School of Medicine, declared that the popular belief that "toxemia" is the cause of death in cases of intestinal obstruction is questionable. The cause of death in untreated complete high obstructions (stomach and duodenum) is probably a physicochemical one. A. C. Silverman, Syracuse University, said that the period of greatest susceptibility of children for poliomyelitis is that from one to nine years of age. Males are more susceptible than females. Outbreaks occur every other year, each outbreak using up the number of susceptibles. This is followed by a year of comparatively few cases, and it is believed that during this period of quiescence a new crop of susceptibles develops. Dr. J. R. Wilson, J. H. Bennett, T. C. Wyatt and Dr. O. D. Chapman, Syracuse University, reported that sensitivity reaction of guinea pigs, previously sensitized to horse serum, was greatly reduced following a fasting period of seventy-two hours.

Edward N. Packard, Saranac Lake, said that about 90 per cent. of autopsy lungs show primary tubercle, usually situated near the pleura. The primary complex may, however, develop elsewhere in the body, such as in the intestine. Primary tubercle may be completely walled off and immunity lost. Those who favor the exogenous theory of the disease are of this opinion. Repeated inhalation of the bacilli are thus more apt to be the cause of the disease than its origin and spread from the primary involvement.

A joint meeting of Sections C, N, F and G and the American Roentgen Ray Society was held on Friday for a symposium on "The Biological Action of X-rays." The symposium was opened with a paper by Dr. Lauriston S. Taylor, of the Bureau of Standards. Experiments conducted at the bureau showed that present physical measurements of the conditions of x-ray treatment in the case of similar biological experiments reported in the literature can not be compared, due to the incomplete data on tube output that is in general given.

Dr. Otto Rahn and M. N. Barnes, of Cornell University, asked the important question, "What is Death?" Three criteria for the decision as to the death of an organism, namely, change in the rate of metabolism, loss of selective permeability of the cells as measured by selective staining qualities and the loss of reproductive power, were compared as to the relative effect of x-rays on production of these changes upon a particular organism.

Interesting papers were presented by Drs. G. Failla, R. E. Herendeen, Douglas Quick, W. P. Davey, H. J. Bagg and R. Isaacs.

Fifty attended a special meeting of the Central New York branch of the Society of American Bacteriologists for the reading of 18 papers. P. Arne Hansen exhibited charts and slides showing the logarithm ten of bacterial counts plotted against time in hours; growth and death of thermophilic bacillus, and generation time at various temperatures. J. D. Brew said that sanitary requirements for milk production at present time are based very largely on opinion. Lantern slides of twelve cases of tularemia (1927–1932) showing occupation, and probable source of infection, were exhibited by Marion B. Coleman. Eleven excellent medical exhibits were presented.

SECTION O (AGRICULTURE)

(Report from T. E. Odland)

Those attending the summer meeting of the Northeastern Section of the American Society of Agronomy met with Section O in a land utilization symposium at Syracuse on Tuesday, June 21. The speakers included Professor G. F. Warren, Professor F. P. Weaver, Dr. J. S. Illick, Professor H. G. Knight, C. L. Rogers and L. R. Schoenmann. At a noon luncheon at the Onondaga Hotel the speakers included Dean Lipman, of the New Jersey Agricultural College.

Following the program at Syracuse the group went to Geneva, where Mr. J. D. Luckett had been very active in arranging an attractive program for visiting agronomists and others in the party. About 60 were present at a noon luncheon at the Pultenney Inn. Following the luncheon a tour of visitation to the various experimental plats was made. The group was especially interested in the Russian lysimeter installation, and experiments in fertilization of orchards, vegetable crops and field crops.

The annual dinner and business meeting of the Northeastern Section was held at the Hotel Seneca in the evening. Professor F. D. Gardner, of Pennsylvania State College, was elected president of the Northeastern Section of the Agronomy Society for the coming year. M. H. Cubbon was elected vice-president and H. C. Swift secretary. Professor Bristow Adams, of Cornell, was the speaker of the evening.

On Thursday morning the agronomists motored to Ithaca, where Cornell University has just completed one of the finest plant industry buildings in existence. Dr. Buckman, of the Department of Agronomy, and Dr. Wiggans, of the Department of Plant Breeding, were the chief engineers of the various trips, to the experimental plats in agronomy, plant breeding and vegetable gardening. Special interest was shown in the cement frame experiments in soil fertility and in the special plant breeding garden being grown for the International Genetics Congress which meets in Ithaca later in the summer.

SECTION Q (EDUCATION)

(Report from William T. Melchior)

Of the twenty-four speakers scheduled to speak before Section Q, twenty-two were present. The programs were run on scheduled time, but interest in the discussions led to "adjourned meetings" following the closing hours. There was really a continuous meeting from 9 to 4:30, as the two-hour noon interim found intact the group before and after the scheduled luncheons.

Dr. M. G. Nelson, of the Albany State College for Teachers, opened the session with a plea for wiser use of state moneys by school administrators, contending that the administrators are now being trained to spend money, not to save it. He felt that education was returning to the days of private schools, because parents felt their children were being jeopardized in the public schools, which are now being so drastically cut in appropriations. Dr. Harry P. Smith reported on the investigations conducted in Syracuse to test the efficiency of the junior high school *vs.* the conventional 8-grade elementary school. His conclusions were that in the conventional set-up there was a greater mastery of the formal skills and knowledges; while in the junior high school there was a significant development of the great life habits and attitudes of initiative, reliability, cooperation and leadership. Dr. Richard K. Piez reported on curriculum problems, contending that in his experience as an administrator in normal schools he had found that the greatest problem is not training how to teach, but what to teach. He felt that much of the curriculum was an inheritance from the past and that youth was not interested in the past. Miss Ruth Eckert declared that there was a high degree of correlation between student success in high-school courses, college orientation and in the regular college courses, but felt that there was a "need for a more searching scrutiny of the manner in which varying procedures influence student achievement—for a closer

linkage between the philosophy of progressive education and the techniques of the more objective methods of evaluating outcomes of college instruction." Professor Rex B. Cunliffe, of Rutgers University, gave a rapid survey of the changes in the life patterns of workers, concluding that "vocational guidance is fundamentally concerned with preparing and helping people make wise decisions, to solve vocational problems intelligently, to meet vocational situations effectively." Dr. Wm. T. Melchior declared that "there are two aspects of science that relate to creative, cooperative supervision. First, science as a body of organized knowledge; second, science as a mode of thinking. In democratic supervision there is danger of basing method too much upon a body of organized knowledge. The findings of science are not fixed according to Dewey's concept of the scientific method. Scientific method in supervision must first of all consider the teachers mind set. She must be put, not on the defensive, but on the offensive. She initiates testing, objective data-gathering and remedial measures. The method is inductive."

Dr. Warren W. Coxe, of the State Department of Education, New York, said that there was no definite conclusion to be made on the desirable size of a high school, for "we can say with some assurance that the very small high school fails to offer a curriculum of sufficient variety and we can say that the very large high school becomes too impersonal." He also felt that "the addition of more courses has not generally solved the question of meeting individual needs, even in the large high schools where the offering is most varied." He concluded that the way to meet pupil needs was through the adaptation of subject-matter and methods rather than by adding courses.

Dr. C. H. Thurber, dean at Colgate University, reported on the new arrangement of tutorial and honors work at his institution, bringing to light information which would validate the continuation of such work at his institution and the initiation of similar work at other institutions.

Dr. Donald Durrell, of Boston University, concluded that: "(1) A group intelligence test score is meaningless unless accompanied by a reading test score; (2) group intelligence tests are greatly affected by school achievement; (3) makers of group intelligence tests have given too much weight to reading ability in these tests; (4) that 'nurture' in the form of achievement in reading has a marked effect on intelligence test scores."

OBITUARY

GEORGE FREDERICK KUNZ, 1856–1932

DR. GEORGE F. KUNZ, whose death occurred on June 29, was a man of eminent attainments in science, of vigorous personality and of indomitable energy. During a long and useful life he has filled with distinction so many high offices that it may well be said that there are few organizations representative of the earth sciences, either local or national, among whose officers he has not served as president or vice-president, and in whose councils his opinion has not helped in the shaping of policy.

Dr. Kunz was mainly educated at the Cooper Union of Arts and Sciences in New York City, an advantage to which he gives grateful credit in the dedication of one of his books. Very early in life he showed a marked talent for the science of mineralogy, and began the building up of a number of collections of minerals which are to-day on display in as many colleges and museums.

His knowledge of gems and gem minerals was recognized as international, a fact that is attested by his lifelong connection as gem expert with the greatest firm of jewelers in the world.

From early youth a New Yorker, Dr. Kunz was associated through five decades with his fellow citizens of prominence from a social as well as from a scientific view-point, and it is doubtful if any of these lived a fuller or a more interesting life, or were more highly honored in the community.

In addition to between 400 and 500 papers on subjects as varied as minerals, meteorites and folklore, Dr. Kunz was the author of "Gems of North America" (1890), "The Book of the Pearl" (jointly with Charles H. Stevenson, 1908), "The Curious Lore of Precious Stones" (1913), "The Magic of Jewels and Charms" (1915), and "Rings" (1917). This extensive list of writings, however, by no means exhausted the field of his interests. He was prominent in such movements as the introduction of the metric system into this country, the development of the uses of radium, and the preservation of scenic and historic monuments.

Inevitably a personality favored with such gifts and attainments must claim honorable recognition. Dr. Kunz was not only the recipient of several honorary degrees but was also distinguished by the decorations of Officer of the Legion of Honor (France), Knight of the Order of St. Olaf (Norway) and Officer of the Rising Sun (Japan).

His scientific interest was always closely linked with the American Museum of Natural History, at which institution he served as research curator of gems from